

**AN ASSESSMENT ON THE IMPACTS OF RURAL WATER SUPPLY AND SANITATION
PROJECT IN ETHIOPIA WITH SPECIAL REFERENCE TO IRC INTERVENTION IN
ASSOSA WOREDA OF BENISHANGUL GUMUZ REGIONAL STATE**

BY

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ABSTRACT

Provisions of potable water supply and sanitation services have a significant contribution on the improvement of the lives' of the people. Projects involved in water and sanitation will have a paramount contribution in the development of rural community. Water and sanitation project, in addition to addressing their direct benefits in providing adequate water supply and sanitation services, has an impact on the health, education, women work load, production and productivity, etc of the rural community.

This study has given emphasis the impacts produced as a result of rural water supply and sanitation project implemented by an International rescue Committee (IRC), an international NGO. The main objective of this study paper was to assess the impact of the project on the target communities. The study was conducted in three project target Kebeles of Assosa woreda of Benishangul Gumuze regional state of Ethiopia. In the study Kebeles the main sources of drinking water was mainly from natural sources like; rivers, ponds, unprotected springs, open HDW and few SWs with hand pumps. The majority of the HPs existed before the project interventions were broken or none functional. As a result, the community was suffering to fetch water from far distances, affected by different water born and sanitation related diseases. Moreover, female in the HH as the main responsible for water fetching were highly work loaded.

In this study a survey has been conducted in 13 villages in the three target Kebeles, which includes 64 HHs as basic respondents and about 36 cases of key informant interviews, focus group discussion and questionnaires were managed in the process of data collection on the several aspects of the project.

Findings of the study showed that the impact of the project was significant in providing potable water with accessible distance, good quality and quantity to the rural community. The activities on the sanitation and hygiene promotion also contributed a lot in reducing diseases in the area. The project has produced tangible impacts on the lives of the community. As a result of having

the access to potable water supply and improved sanitation and hygiene, the community able to get the economic, social and environmental impacts.

Some of the impacts include; water is accessible and quality, time is saved, health of the community and work power improved. Improvement in work power directly or indirectly contributed in increasing production and productivity that has part in attaining food security of the community. As the health of the community improved medical expenditure has reduced. The project helped to reduce work load on women and girls as they are the main responsible for water collection and sanitation in the community and hence women can have time for other economic activities and to attempt social commitments and responsibilities. Girls can attend their education. Defecating in the sheltered and clean latrines has psychologically benefited to the community as it keeps privacy instead of outside defecation which was frustrating when people are passing around while in open defecation. The other impact observed was environmental impact; the project helped to reduce water sources contaminations, helped to have clean spaces where children or elderly can play or talk safe and the breeding of insects reduced, and health situation is improved in the area.

With these all impacts obtained as the result of the intervention, the question of sustainability is still in question. Some of the new water structures have problem with their handle within this short time of project completion. The ownership level of the community looks small as they are not seeking a solution by themselves for small maintenance problems. The mobilization and awareness creation to the community should also not be limited to the project period only but also should be a continuous process in the target kebeles. If the project outcomes and attributes to be sustainably produce an impact on the lives' of community, the responsible government bodies especially the Woreda water and health offices have to work jointly to keep the good start to continue long lasting.

DEDICATION

This study is dedicated to my mother, Felekech Woldeteklie, one of the rural women who had suffered a lot in water collection for live long from far distances as a sole responsible person from our HH members and to all rural women of Ethiopia.

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LIST OF ACRONYMS

| | |
|-------|--|
| BGRS | Benishngul Gumuz Regional State |
| BH | Borehole |
| BoFED | Bureau of Finance and Economic Development |
| BWEM | Bureau of Water, Energy and Mining |
| CLTSH | Community- Led Total Sanitation and Hygiene |
| CSA | Central Statistics Agency |
| DA | Development agent |
| DFID | Department for International Development |
| DHS | Demographic and Health Survey |
| DRS | Developing Regional States |
| EH | Environmental health |
| FDRE | Federal Democratic Republic of Ethiopia |
| ETB | Ethiopian Birr-Currency (currently 1UD equals to about 18 ETB) |
| FGD | Focus Group Discussion |
| GIS | Geographic Information System |
| GTP | Growth and transformation plan |
| HEW | Health Extension Worker |
| HH | Household |
| HP | Hand Pump |
| HDW | Hand Dug Well |
| IRC | International Rescue Committee |
| JMP | Joint Monitoring Program |

| | |
|--------|---|
| KA | Kebele Administration |
| Kit | Kebele Ignition Team |
| KPC | Knowledge |
| MASL | Meters Above sea Level |
| MDG | Millennium Development Goal |
| MOFAN | Ministry of Foreign Affaire the Netherlands |
| MOFED | Ministry of Finance and Economic Development |
| MOWR | Ministry of Water Resources |
| NGO | Non Governmental Organization |
| ODF | Open Defecation Free |
| PASDEP | Plan for Accelerated and Sustained Development to End Poverty |
| SNNPR | Southern Nations Nationalities Peoples Region |
| SW | Shallow Well |
| UNICEF | United Nations International Children’s Emergency Fund |
| VCHP | Volunteer Community Health Promoters |
| VIP | Ventilated Improved Pit |
| WASH | Water, Sanitation and Hygiene |
| WHO | World Health Organization |
| WMC | Water Management Committee |
| WWO | Woreda Water Office |

CHAPTER ONE: INTRODUCTION

1.1. Background

Ethiopia is one of the countries with plenty of water in the world. Preliminary studies and professional estimates indicated that the country has an annual surface runoff of close to 122 billion cubic meters of water excluding ground water (MoWR, 2001). The country has number of cross bounding rivers which flow regularly throughout the year, number of lakes, lots of small rivers, springs and abundant annual rain fall. Ethiopia being one of the countries with plenty of water resources is still with one of the lowest safe drinking water and improved sanitation. In this regard on the IRC WASH project proposal document mentioned as, 'Water and sanitation coverage rates in Ethiopia are among the lowest in the world. Only 26% of rural Ethiopians use improved water sources and only 8% use improved, hygienic sanitation facilities, Ethiopia is not on track to meet MDG 7 for water and sanitation. Ethiopia's targets are 61% coverage for water and 53% for sanitation by 2015' (IRC WASH project proposal 2011, taken from 2010 United Nations MDGs progress report).

Benishangul Gumuz Regional State (BGRS) in general and Assosa woreda in particular is said to be one of the back ward areas in the country. In spite of abundant water resources of the region and the woreda, safe drinking water for the population was in a short supply (BoFED, fact about BGRS bulletin, 2007). Most of the rural kebeles in the woreda either does not have any improved and modern water supply system or the structures which have been already developed are not functioning because of damage or poor maintenance. The supply of safe water is worse in rural areas than urban area. The majority of rural communities were forced to fetch water from unsafe sources such as rivers, ponds and unprotected springs. The same was true for sanitation and hygiene. Most of the rural

households do not have clean and hygienic latrines. Most rural households also do not have places to discard dry wastes. Poor water source and poor sanitation and hygiene led rural communities in the woreda for sever health problems.

To complement the government target, actors like NGOs are playing their part. International Rescue Committee (IRC) an American based international Non Governmental Organization (NGO) established in 1933, working in more than 40 countries of the world. The organization is operational in BGRS since 2003 for both Sudan refugee and local community programs. The organization is working in different thematic areas, out of which water supply development, sanitation and hygiene promotion both for refugees and local communities is highly significant. The Water, Sanitation and Hygiene (WASH) project under this study developed for local communities launched in 2011. Within this project, IRC started implementing improved water, hygiene and sanitation promotion activities in two selected woredas, namely; Assosa and Moakomo special wereda for the year 2011/2012(October, 2011- September, 2012). The water, hygiene and sanitation promotion activities aimed at increasing safe and sustainable access to water, and improving sanitation and hygiene knowledge/practices in the targeted communities. This project is implemented for the last one year and as a result currently several water and sanitation structures constructed, community awareness trainings given, different implementing committees and boards established.

At the beginning of the IRC WASH project in October 2011, the baseline survey revealed that the majority of households (80%) get drinking water from unimproved water source; only 20% of the households get from improved water sources. Only about 30% of the households use latrines (IRC WASH project proposal, 2011). Washing hand after defecation and before food was not a common practice and outside defecation of human excreta was totally not a taboo in these communities. Typhoid, Diarrhea and other health

problems were common issues. People take much of their time especially women and girls to collect water from far distance unprotected water sources.

Different structure were planned to be implemented by the project to alleviate the problem of water, hygiene and sanitation in the target kebeles of rural communities. These includes; development of shallow boreholes, hand dug wells, protected springs, latrines for schools, roof water harvesting, dry waste pits, household latrine, awareness creation and training on the usage and importance of the developed structures and the consequences that will come as a result of not using these improved interventions. Moreover activities like school hand washing day, events of graduation of free from outside defecation (ODF) kebeles were planned as a subordinate activities.

1.2. Statement of the Problem

According to UNDP (2006), in the world almost 2 million children die each year because they do not get a glass of potable water and basic sanitation. And millions of women and young girls are forced to spend hours fetching and carrying water. Sub-Saharan African countries are at the front of the water scarcity problem, one of which is Ethiopia despite the fact that the country has abundant groundwater, major lakes, and large volumes of rainfall (Betelhem, 2011). The problem of potable water supply and sanitation is by far high in rural areas than urban areas of the country. To overcome the problem, in 2010, the government of Ethiopia presented the Growth and Transformation Plan (GTP) 2011-2015 that aims at increasing drinking water coverage, from 68.5% in 2010 to 98.5% in 2015. On the GTP it is also indicated that the government of Ethiopia is working to reduce the problem by targeting the rural population access to potable water within 1.5 km and urban population within 0.5 km (GTP, 2010).

In the study area the coverage and access to improved water supply and sanitation services are even worse than the national average. The results of the baseline survey made before the erection of the project under study showed that in the three target kebeles of this study only 20% of the households get drinking water from improved water sources and only 32% of the households use improved latrines.

The water sources are far from villages and households especially women and girls spent much of their time to fetch water from unsafe and unprotected water sources which include water sources like rivers, traditional hand dug wells, unprotected springs and ponds. This will have a negative consequence on their labour productivity and on achieving their social responsibilities. Household members drink unsafe water, could not easily clean their clothes, and could not bath regularly because of the lack of sufficient water. These problems expose them especially children for water born diseases like diarrhea and other health problems. Lack of hygienic and well constructed latrine is also the other challenge of these communities. People usually defecates their excreta in open spaces. They don't wash their hands after defecation or before feeding. The low level of sanitation facilitates best breeding place for insects especially flies which are the leading spreaders of most communicable diseases and finally leads the community for associated health problem. Moreover, outside defecation has a psychological impact on the community members.

The communities in these target kebeles are not getting clean potable water because either there is no improved water supply system in their villages or the already constructed improved water sources are not functional. The available water structures which have been constructed in the past are getting non functional because of lack of poor maintenance or old age. There is no hygienic latrine because of the lack of awareness among the community. Not only at household level, the problem of water and sanitation

also observed in schools and health centers. To overcome these water and sanitation problems a base line survey has been conducted by IRC to assess the status and identify the magnitude of the problem in order to develop an intervention package.

Based on the baseline survey IRC developed an intervention WASH project to develop water supply systems and sanitation services in these Kebeles. During the implementation of the project several improved water supply structures were constructed in the study area, which include; boreholes, hand dug wells, protected springs, roof water harvesting for schools and health centers, latrines for schools and household levels. Moreover activities like; awareness raising community conversations, trainings, establishment of water management committees, etc were exercised. To evaluate the achievements obtained, impact gained as a result of the new interventions, undertaking an assessment study shall be unquestionable.

Therefore, this study is initiated to assess the impacts of the improved access of rural water supply system and sanitation services on the lives' of the community in the three target kebeles of Assosa woreda. The study also expected to assess; the improvements in the access and coverage of water and sanitation services, identify who gained more benefit from the interventions, assess the improvement in the lives of the rural community and sustainability of the project, assess whether the intervention can be adoptable and replicable to other areas and above all to assess whether the objectives of the project achieved and water and sanitation problems of the rural communities solved in the target kebeles.

1.3. Objective of the Study

The main objective of this study paper is to assess the impacts of rural water supply and sanitation services with special emphasis to water supply and sanitation project of none governmental organization's (IRC) interventions in the project target communities.

The Specific Objectives of this Study Paper include:

1. Evaluate whether the project objectives and targets are achieved according to the initial plan of the project
2. Study the improvements on the coverage and access of potable water and sanitation services in the target rural community as a result of the interventions
3. Assess the changes gained towards improved living (economic, social and environmental) benefits as the result of the water supply and sanitation services
4. Document the lessons learnt which helps for scaling up the NGO approach and forward possible recommendation that can help provide enhanced interventions that better produce impact on the living condition of the communities.

1.4. Significance of the Study

Firstly, the research findings can serve as a source of reference to other individuals, scholars or organizations interested to work on similar studies. It could be pretty important as a reference as there are no sufficient studies made on the topic especially in the region.

Secondly, the paper is focusing on the achievements and the impacts of the rural water and sanitation intervention project especially introduced by an NGO, the lessons and finding gained will have a paramount importance in the development of new and similar projects or to scaling up it for the organization itself and also serve as initial reference

document for other organizations that have interest to starting similar interventions in rural areas.

1.5. Scope of the Study

The focus of this study is on 26 villages of three rural kebeles of Assosa Wereda of BGRS by IRC where the water supply and sanitation project implemented. The IRC water supply and sanitation development project is working in two woredas of the region; namely in Assosa and Mao Komo woredas. The water and sanitation project targeted three kebeles from each of the two woredas. The two woredas are far apart, due to cost and time limitations, the researcher decided to limit his study only in the project intervention villages of Assosa woreda.

1.6. Definition of Important Terms and Concepts

Improved Water Source

An improved drinking-water source is one that, by nature of its construction or through active intervention, is likely to be protected from outside contamination, in particular from contamination with fecal matter. For this particular study improved water source include water obtained from well constructed boreholes, hand dug wells, protected springs, harvested roof water and the water get treated to be safe for drinking.

Access to Improved Water Source

World Bank define access to an improved water source refers to the percentage of the population with reasonable access to an adequate amount of water from an improved source, such as a household connection, public standpipe, borehole, protected well or spring, and rainwater collection. Unimproved sources include vendors, tanker trucks, and

unprotected wells and springs. Reasonable access is defined as the availability of at least 20 liters a person a day from a source within one kilometer of the dwelling.

Rural water supply schemes

Water supply points installed in rural areas that include HDWs, SWs, and Boreholes (Aschalew M, 2011)

Sanitation

Sanitation refers to all conditions that affect health especially with regard to dirt and infection and specifically to the drainage and disposal of sewage and refuse from houses. Thus, sanitation refers to methods of hygiene that relate to safe collection, removal and disposal of human excreta and waste water. Sanitation in this study basically refers to or centered on the sanitary disposal of human excreta, dry waste and hygiene promotion.

Improved Sanitation

The National Hygiene & Sanitation Strategic Action Plan (2011) defines improved sanitation as, sanitation options which are not considered “improved” include: public or shared toilet, open pit toilet and bucket toilet. The Millennium Development Goals (MDGs), the World Health Organization/ UNICEF Joint Monitoring Program (JMP) for Water Supply and Sanitation defines "improved" sanitation as follows: Flush toilet, Connection to a piped sewer system, Connection to a septic system, Flush / pour-flush to a pit latrine, Ventilated improved pit (VIP) latrine, Pit latrine with slab and, Composting toilet.

Hygiene

Hygiene refers to practices associated with ensuring good health and cleanliness. This includes Hand washing with soap and water at critical times most notably after defecation or before contact with food and strict observation of the safe drinking water chain (MOH, 2011).

Outside Defecation Free Kebeles

Refers to all households in the kebele have their own private latrines and communal latrines so that no people in that particular geographic area defecate their excreta in open space.

Woreda

A Wereda is Government administrative unit which is equivalent to a district that covers a unit geographic area that further split into a number of kebeles.

Kebele

Kebele is Government administrative unit at grassroots level. In a single kebele there could exist several small villages, which locally known as 'gott'. In the study kebeles, villages or gotts are distributed within the boundary of the kebele.

Village or Gotts

Village or gott in this study context refers to some rural households living together as a neighborhood. In this study area a single village or gott consist 12 to 30 households.

CHAPTER TWO: LITERATURE REVIEW

The researcher attempted to review similar literatures that have been done in the previous times by other people to get guidance for the research work he is under taking. Some of the reviews made are presented below.

2.1. Access and Coverage of Water Supply and Sanitation

MOWR (2001) on the water sector policy document stated as, 'For all the water development activities achieved so far, the average access to clean and safe water supply is about 17% of the total population of Ethiopia. This can be cited as an example of a very low supply and coverage level even by Sub-Saharan African standards. It must be noted here that the coverage figures will even reflect much worse situations considering the unreliability and un sustainability of the supply of safe water.'

MOFAN (2012) under the title of Rural water and sanitation, assessing impacts stated as 'on the progress on water and sanitation that been good on increasing access to clean drinking water. The global target is likely to be surpassed, although rural areas are lagging behind and more than one in ten people may still not have full access to safe drinking water by the 2015 deadline. While some regions, such as east and south-east Asia, have already gone beyond the target, progress varies widely. Sub-Saharan Africa remains far behind: Despite having almost doubled the number of people using an improved water source between 1990 and 2008, coverage was still only 60% in 2008. The 2011 report shows slower worldwide progress with regard to basic sanitation, where the picture is quite bleak. The percentage of the world's population using an adequate toilet rose just 7% from 1990 to 2008, from 54% to 61%. Almost half the population in developing regions does not have access to sanitary facilities, and an estimated 1.1 billion

people practice open defecation, exposing themselves and their communities to major health risks.’

Growth and Transformation Plan (GTP, 2010), stated as Ethiopia’s water supply coverage has improved from 19 per cent in 1990 to 65.8 per cent in 2010 (comprising 62 per cent rural and 91.5 per cent urban). During the same period, sanitation coverage increased from 4 per cent in 1990 (JMP estimate) to 60 per cent in 2009 (MoH), with rural coverage lagging behind urban coverage (56 and 88 per cent, respectively). Most of these increases were accomplished during the 2005-2010 PASDEP implementation period. The growth in water and sanitation coverage is remarkable, given the various constraints outlined in the preceding section.

MOFED (2010) stated that, in 2010 access to drinking water was estimated at 68.5%: 91.5% in urban areas (within 0.5 km) and 65.8% in rural areas (within 1.5 km). The higher figure for rural areas may be because the distance to an improved water source used in this definition is higher than the distance used by the Demographic and Health Survey. In 1990 access to improved water supply had been estimated at only 17%, and access to improved sanitation had been estimated at only 4%. There thus has been a significant increase in access for water supply and sanitation, which spans both urban and rural areas. More than 138,000 improved community water points were constructed and rehabilitated from 2008 to 2010.

MOH (2011) on the National Hygiene & Sanitation Strategic Action, Plan for Rural, Peri-Urban & Informal Settlements in Ethiopia 2011-2015, indicated that ‘Ethiopia has made great strides increasing both its water supply and sanitation coverage since 1990, when these indicators stood at 19% and 5% per cent, respectively. Much of the progress in access to sanitation has actually taken place since 2000 when the Health Extension

Programme was introduced and its cadre of over 30,000 Health Extension Workers undertook household sanitation promotion as part of the Model Household Programme. Innovative, large scale sanitation campaigns were then organized in SNNPR and later, in Amhara Region. More recently, introduction of the Community Led Total Sanitation and Hygiene (CLTSH) approach to community and household hygiene and sanitation has re-invigorated the sector and helped reach more communities with the goal of ending 'open defecation' through self-built toilets, and by encouraging appropriate hand washing and water handling practices. In spite of this progress, about 30 million Ethiopians still lack basic sanitation facilities and less than 20 per cent of our population are regularly washing their hands with soap and water at critical times. Unsafe water handling and storage means that nearly 40 per cent of the water consumed in homes is contaminated with faecal matter. Sanitation and hygiene are not only important in terms of controlling communicable water-and hygiene-related diseases, but also because of the important link between these diseases and childhood malnutrition. Indeed, Ethiopia will not meet its goals for improving child health and nutrition if we do not tackle the hygiene and sanitation situation'.

BOWME (2007) indicates that the coverage of water supply is increasing through time for both rural and urban areas of BGRS. Accordingly the coverage of water supply in the region was only 23.52% in 2000. From this total 59.27% accounts for urban and only 20.2% accounts for rural. The figure for total coverage has significantly increased to 48.66% in 2008. From this total 78.08% is in towns and 43.28% is in rural areas.

BOFED (2007) on the on the fact of the region bulletin indicated that in spite of abundant water resources of the region, safe drinking water for the population was in a short supply. But, presently since the regional government provides due attention to the sector,

44.1% of the total population have access to potable water from hand dug wells, medium deep ,deep wells and developed spring. The supply is much better in urban areas 66.16 % than rural areas (40.13%). However, most of the region's water supply is mainly through traditional dug wells and to some extent boreholes. Towns like Assosa, Mandura and Bullen are obtaining their water supply from boreholes. Rural villagers are using small spring, which have a very low yield. However this coverage seems to be calculated assuming all the water structures in both rural and urban areas were functional. In realistic terms the coverage is even by far less than what is stated by the bureau as some of the structures were not functioning.

Assosa WWO (2012) on the summary report of safe water access in the worda mentioned that the coverage of water in the worda for rural areas was 52% in June 2012 assuming 15 liters of water per day per person within the distance of 1.5 kilometers.

IRC (2011), in WASH project proposal document stated as, nearly half of the rural population in the BGRS region does not have access to safe drinking water. These targeted wordas have very little government and external funding for water and sanitation improvements. According to an IRC initial assessment in 2010, the coverage rate for drinking water was only 27% for the communities in Assosa Woreda. It was also indicated that only 25% of schools and health facilities in BGRS have access to improved water points in their compounds. Water for cleaning and hand-washing is often unavailable. The baseline survey report also pointed out that the households that have access to clean potable water in the study target kebeles was 20% only in 2010. In the initial project survey it was also indicated the coverage for improved sanitation service in rural areas of Assosa Woreda was only 32%.

2.2. Water Resources and Quality

BOWME (2000) on the document Inventory on improved water supply systems of BGRS indicated that the main sources of drinking water in the region were HDW, BH and springs. Accordingly there have been 461 structures of such types in 2000 in the region. The inventory indicated that from these total structures, 157 were not functional.

The main sources of rural potable water in Assosa woreda were also HDW, SW and protected springs. In June 2012 there have been 208 of such structures in the rural parts of the district. From these total, 23 of them were not functional (Assosa WWO, 2012).

IRC (2010) on its initial rapid assessment, people without access to improved water sources depend mainly on unprotected springs and ponds. These sources are located outside the communities, forcing women and girls to travel long distances for collection of a small amount of unsafe water. As most of the springs, streams and ponds dry up during dry seasons, women (who usually fetch water) need to travel even longer distances to neighboring communities to find water sources, putting them at higher risk of violence. The IRC's discussions with rural communities revealed that there is often conflict over the use of limited water sources in these areas.

BOFED (2007) on the bulletin entitled facts about Beneishangul Gumuz mentioned that the type of water in the region is predominantly bicarbonate: Pure or transitional Ca HCO₃ typed. In addition to the Calcium types of ground water, Na HCO₃ /pure or transitional/ and transitional, Ma Ca HCo₃ types of ground water are Known in the region. Moreover, the hydrogeology study/1991/ of Asossa and Aba Ramla rivers revealed the existence of mineralized ground water in the region.

IRC(January 2013) on its draft project final report indicated that the quality of drinking water in BGRS is worse from natural sources. The reports made on quality of water by IRC on the water gained from BH, HDW and springs showed the water quality for the new water structures is checked with the regional water laboratory before use. Based on the water testing it has been found that the water is up to the standard for drinking.

2.3. Types of Sanitary Services and Their Quality

Solomon Bekele (2011) in his paper entitled An Assessment on the Status of Water Supply and Sanitation in Ethiopia: A Case of Ambo Town mentioned the type of latrines and how only small part of the rural community are using it stated as: the majorities of HHs (68.9%) do not have toilet facilities and hence use an open field or forest. About 28.1% of the total HHs used a pit latrine. This finding is more of an influence of rural HHs where more than 78% do not have toilet facility. Only 10% of rural HHs have pit latrine.

The IRC (2010) initial survey document showed that the majority of the project target community does not have improved latrines. Only 32% of the community have improved pit latrine, the remaining use either not improved latrine or use open defecation.

The IRC (2013) final project report showed that most (84%) of the target communities use improved pit latrine that is sheltered and covered.

2.4. Impacts of Access to Improved Water Supply and Sanitation services on the Lives' of Rural Community

Richard Carter, and et al (1999) in their paper Impact and Sustainability of Community Water Supply and Sanitation Programmes in Developing Countries mentioned that Proposed infrastructure developments can only be viable (a) if they will have a beneficial

impact on communities, and (b) if this impact will be long-lasting or sustainable. Unless beneficial and sustained impact is likely, there is little point in carrying out environmental, economic, and other appraisals with a view to subsequent implementation. This is as true of developed as of developing countries, and as true of the water and sanitation sector as of any other.

The same authors in clarifying that projects fail to benefit the beneficiaries said that in developing countries, a significant number of projects, including those in the water and sanitation sector; fail to deliver benefits to society over the long term. Part of the cause of this failure lies in poor understanding of the issues of impact and sustainability.

In addition these authors on the same study concluded that inadequate water supply and sanitation services in developing countries result in excessive expenditure of time and energy, water- and excreta-related disease, and lack of privacy in defecation. Water and sanitation projects often fail to achieve significant impacts in all these aspects, and systems are often under-utilized, broken down, or abandoned.

Susanne Hesselbarth (October 2005) in the paper entitled Socio-economic Impacts of Water Supply and Sanitation Projects stated as: the provision of safe drinking water and basic sanitation contributes to sustainable improvements in peoples' lives regarding their health and education situation, the preconditions for productive employment as well as for the eradication of extreme hunger and the empowerment of women. The author further explained about the impact of water and sanitation services as: water supply and sanitation are essential for human health and survival, for food security and the empowerment of women as well as the education of girls, for reduction in productivity losses due to morbidity and malnutrition, for the management and protection of natural resources. Although the crucial importance has been widely recognized, the right to safe water and adequate sanitation remains a promise unfulfilled for the world's poorest

citizens. The lack of access to safe drinking water and to basic sanitation impedes economic development, thwarts progress towards gender equality and puts the health in danger. The unsustainable exploitation of natural resources is often due to insufficient or inadequate water supply and sanitation. The arguments in support of expanding the access to water supply and sanitation services and promote environmental sustainability can be expressed in terms of human values, human rights as well as in health and economic terms. Access to basic services like water supply and sanitation is a moral and ethical imperative rooted in the cultural and religious tradition of societies around the world. The United Nation have affirmed the Right to Water in 2002, recognizing that the right to water is indispensable for leading a life in human dignity and a prerequisite for the realization of other human rights. It states that the human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic use. The statement echoes the importance that adequate water supply and sanitation has for the health situation, for economic and social development and for an ecological balance.

Susanne Hesselbarth (October 2005) explained as: Assuring the water supply for the household has significant consequences both in terms of time and monetary costs. At the same time, insufficient and inadequate water supply and sanitation result in increased health risks for the population and a higher morbidity and mortality due to water related diseases. Improving water supply and sanitation will have a positive impact on the individual income and poverty situation of the beneficiary household. Reducing the time and energy burden of water collection by providing safe water at a nearer distance will enable household members to engage in other activities, among them productive and income generating activities. Improved water quality will reduce the health risks and also the costs of preventing and treating ill family members. Furthermore, the reduction of

working days lost to water-related diseases will also have a positive impact on the household's income situation.

Susanne Hesselbarth (October 2005) on the same title regarding environmental impact stated as: Improved water management, including industrial pollution control and water conservation is a key factor for maintaining ecosystem integrity. Adequate treatment and disposal of excreta and both household and industrial wastewater contribute to less pressure on freshwater resources. Furthermore, improved sanitation reduces flows of human excreta into waterways and reducing the respective health and environmental risks. Furthermore, water, sanitation and hygiene is important for improving the lives of slum dwellers, by reducing the risks of contracting water-related illnesses, relieving the burden on women and opening opportunities for small-scale enterprises.

In the impact assessment of rural development projects in general and in water supply and sanitation service projects in particular both qualitative and quantitative methods could be implemented jointly.

Sabine Garbarino and Jeremy Holland (March 2009) in the study of Quantitative and Qualitative Methods in Impact Evaluation and Measuring Results stated that qualitative and quantitative methods and data are often more powerful when combined, at different levels and in different sequences, we can categorize different ways of combining and sequencing. In the same study these authors mentioned that in Carvalho and White (1997, 18) usefully describe three ways of combining the best of qualitative and quantitative approaches: (1) integrating methodologies for better measurement, (2) sequencing information for better analysis, and (3) merging findings for better action. We elaborate briefly on these three areas below and apply them to their potential use in impact evaluation.

They further explained how the joined both qualitative and quantitative methods are important in impact evaluations as; When considering ways to combine quantitative and qualitative methods and data, it is important to be aware of their comparative advantages and to recognize that ‘strong fences make good neighbors’ (Appleton and Booth, 2005). In short, while quantitative methods produce data that can be aggregated and analyzed to describe and predict relationships, qualitative research can help to probe and explain those relationships and to explain contextual differences in the quality of those relationships. Qualitative research is able to use social analytical frameworks to interpret observed patterns and trends-including analysis of socially differentiated outcomes-and to analyze poverty as a dynamic process rather than a static outcome. One rapidly growing area of qualitative analysis is political economy analysis, which was operationalised by DFID through the Drivers of Change initiative for country system analysis, widely used for analysis of sector and policy reform in PSIA and which is now being applied to ‘problem-focused’ analysis, such as recent DFID-funded analysis of growth policy options in Uganda.

Judy(2000) on a Handbook for Practitioners entitled Evaluating the Impact of Development Projects on Poverty indicated that although there is extensive literature on qualitative versus quantitative methods in impact evaluation, there is also growing acceptance of the need for integrating the two approaches. Integrating qualitative and quantitative evaluation can often be the best vehicle for meeting the project’s information needs.

CHAPTER THREE: RESEARCH METHODOLOGY

This chapter discusses on description of study area, design of the study, methods of data collection and the data processing. The results in this paper are driven from field survey conducted in three kebeles where the project is operational. Both qualitative and quantitative data were collected from both the primary and secondary sources.

3.1. Description of the study area

Benishangul Gumuz Regional state (BGRS) is one of the nine regions of Ethiopia. According to BOFED (2007), the region is known to be one of the lowest levels in its development. This is reflected by its low level of development in terms of social, economic and infrastructural access and availability in the region. The current low level of development emanated from the past neglect of the region in the development as well as wide dispersal of the region's population. Nevertheless, the BGRS has a substantial and varied natural resource base. The region has suitable agricultural land and a considerable number of livestock resources although not yet utilized to the expected level. Its water resources are vast due to the existence of a number of perennial rivers. Various types of minerals that could be used for industrial and construction purpose also found in the region. In addition to these, the region has a big potential in natural tourism attractions because of the existence of diversities flora and fauna resources. Despite the immense exploitable resource of the region, its resources have not been fully assessed and documented in such way that it attracts the attention of potential investors.

Location

The BGRS is located in the North West part of Ethiopia bordering the Sudan. The region is situated in the Blue Nile River Basin. The land mass of the region is estimated to be

of the region ranges from about 580-2731 MASL (BOFED, 2007). According to Aschalew, 2011) the annual rainfall amount ranges from 900-1500mm. It obtains high rainfall for about six months, from May to October in the year. The temperature in the region usually is hot and humid. It varies with annual minimum 13°C to maximum 33°C. The study area, Assosa woreda, in general is hot humid with higher altitude relatively to the most woredas in the region. The temperature of the woreda is hot humid in the rainy season and dry hot in the dry season that ranges from 15°C to 27 °C.

Population

The total population of the region was estimated to be 670,847. Out of which 87,366 reside in Assosa woreda based on the (CSA, 2007) national census of Ethiopia. From this total figure, 44,176 were men and 43,190 women residences of the woreda. The projection for the population shows the population of the region to be 938,996 in the year 2010. According to the projection the population size of the Assosa woreda is estimated to be 127,248 (64,673 Male and 62,575 Female) in 2010. The numbers of population is also growing rapidly from time to time. Currently the population can be even more than this figure. The vast majority of the population in the region lives in rural areas (90.3% rural and 9.7% urban-2005 projection of CSA) in a very sparsely populated and scattered settlement. According to BOFED (2007) the rural populations are living in remote and inaccessible areas follow scattered settlement system, which are about 12 persons per Km².

The three kebeles under this study namely; Komoshiga 27, Komedhiga 25 and Ateto have an estimated total population of 3106 based on the baseline survey report of the project under study.

Culture and Language

In the region different ethnic back ground people are residing. Some are typically native (Berta, Gumuz, Shinasha, Mao and Komo people) and there are also different non-indigenous ethnic groups inhabiting throughout the region (BOFED, 2007). These includes; Amharas, Oromos, Tigray and others. Berta along with Gumuz holds the majority of the population of the region. Berta ethnic groups are living in Asossa zone while Gumuz inhabits in Metekel and kamashi zones. Shinasha are found in Metekel zone, Mao and Komo, are found in Mao Komo special wereda.

Within the region there are various types of religion. The well known and the dominant once are Muslim, Orthodox, Christian protestant, Catholic and traditional believe followers (BOFED, 2007). Muslim and orthodox Christian followers constitute the majority of the population of the region. Arutani and Gumuz Languages are the most widely spoken languages as a mother tongue. Arutani is a language that is spoken by Berta people in most parts of Asossa zone. Amharic and Oromigna Languages are the widely spoken languages as second languages. In addition to this, Amharic Language serves as working Language of the region.

Livelihoods

Most of the rural Household's livelihood depends on traditional gold mining especially the native communities. Traditional crop cultivation and livestock rearing, hunting and fishing are the other sources of livelihoods for local native communities. Communities of non-indigenous are usually subsistence farmer. They produce both crop and livestock together. Mango fruit is used as a cash crop for both indigenous and non-indigenous people of the region in general and Assosa woreda in particular (BOFED, 2007).

Though the region have a vast cultivable land with several perennial rivers including river Abay (Nail), agricultural production is subsistent. This is due to the fact that there is no sufficient supply of modern input to improve those peasants who are engaged in subsistent agriculture, there is no sufficient financing institution, rural cooperatives are yet in formative stage, etc. Rural people especially the natives still use very traditional farming tools; they don't have sufficient awareness to manage their farms to boost productivity. They usually spend by finding gold traditionally. Gold mining take much of their time, however after a week or a month of digging dip holes they may not get any to support their families.

Drinking Water and Sanitation Experiences

In spite of abundant water resources of the region, safe drinking water for the population was in a short supply. However, presently since the regional government provides due attention to the sector, nearly half of the total population have access to potable water from hand dug wells, medium deep wells ,deep wells and developed spring. The supply is much better in urban areas than rural areas. Most of the region's water supply is mainly through traditional dug wells and to some extent to boreholes. Major towns in the region are obtaining their water supply from bore holes. Rural villagers are using small spring, which have a very low yield. The type of water in the region is predominantly bicarbonate (BOFED, 2007).

According to the project base line survey, most of the rural kebeles in the region in general and in Assosa woreda in particular either does not have any improved and modern water supply system or the structures which have been already developed are not functioning because of damage or poor maintenance. The supply of safe water is worse in rural areas than urban area. The majority of rural communities were forced to fetch water

from unsafe sources such as rivers, ponds and unprotected springs. The same was true for sanitation and hygiene. Most of the rural households do not have clean and hygienic latrines. Most rural households also do not have places to discard dray wastes. Poor water sources and poor sanitation and hygiene lead rural communities for sever health problems.

At the beginning of the IRC WASH project in October 2011, the baseline survey revealed that the majority of households (80%) get drinking water from unimproved water source; only 20% of the households get from improved water sources. Only 32% of the households use latrines. Washing hand after defecation and before food was not a common practice and outside defecation of human excreta was not totally a taboo in these communities. Diarrhea and other health problems were a common problem. People take much of their time especially women and girls to collect water from far distance unprotected water sources.

3.2. Universe of the Study

This study was conducted in Assosa woreda of BGRS focusing on twenty six villages of the three IRC WASH Project target kebeles of Assosa woreda namely; Komoshiga 27, Komeshiga 25 and Ateto kebeles. The total population of the three project target kebeles was estimated to be 3106 according to initial base line survey document of the project. From these total populations 1240 people reside in Komeshiga 25 kebele, 1297 people in Ateto Kebele, and the remaining 569 people reside in Komeshga 27 kebele. In these project target kebeles there were a total of 625 households, of which 295 found in Komeshga 25 kebele, 116 in Komoshga 27 kebele and 214 in Ateto kebele. The households of these kebeles reside in 26 distinctly separated villages or locally know us 'gotts'. Each kebele has a number of villages or "gotts"; Komoshiga 25 has 12 villages,

Komeshiga 27 has 6 villages and Ateto kebele has 8 villages. Each village consists of households ranging from 12 to 30. The total population for the kebeles under study is shown below on Table 1.

Table 1: Total Population of the Kebeles under the Study

| No | Name of Kebele | Total Population | Number of House Holds (HHs) | Number of Villages/Gotts |
|----|----------------|------------------|-----------------------------|--------------------------|
| 1 | Komeshiga 25 | 1240 | 295 | 12 |
| 2 | Komeshiga 27 | 569 | 116 | 6 |
| 3 | Ateto | 1297 | 214 | 8 |
| | G. Total | 3106 | 625 | 26 |

3.3. Sample Design

A sample is a miniature representation of and selected from a large group or aggregate. In other words provides a specimen picture of larger whole (IGNOU-MRD-004-Tools of data collection). Accordingly to determine the sample size from the three kebeles the determined number of villages was randomly selected. Fifty percent of the villages from a single kebele were selected from total number of 26 villages. The number of selected villages from each kebele was proportional to the number of villages in each Kebele. Sample households were selected randomly from the selected villages. Assuming 12 to 30 households reside in one village the researcher included in his sample about 20% of the households from the sampled villages. During the field survey all (100%) the sampled HHs holds interviewed. The researcher had also been undertaken key informant interview with health extension workers (HEWs), development agents (DAs), school teachers (ST), Kebele administrators (KAs), and an elderly (EL) at each Kebele, two focus group discussions; one women group (WG) and one men group(MG) at each kebele. Moreover data was collected by sending questionnaire for regional water, energy and mining bureau expert, woreda water office experts, woreda health office expert, and IRC water and

sanitation officers. In sum; data is collected from a total of 100 cases during the data collection which means data were collected from more than 98% of the sampled cases.

Based on the above clarification the sample was taken for the study as presented on Table 2 below.

Table 2: Sample Size Taken for the Study

| No | Kebele/Other Agencies | Got | HH | D A | HE W | ST | KA | E L | MG | WG | Questionnaire | Total |
|----|-----------------------|-----|----|-----|------|----|----|-----|----|----|---------------|-------|
| 1 | Komoshiga 25 | 6 | 30 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | | 40 |
| 2 | Komoshiga 27 | 3 | 12 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | | 22 |
| 3 | Ateto | 4 | 22 | 2 | 2 | | 2 | 1 | 1 | 1 | | 31 |
| 4 | Woreda Health Office | | | | | | | | | | 1 | 1 |
| 5 | WVO | | | | | | | | | | 2 | 2 |
| 6 | BWEM | | | | | | | | | | 1 | 1 |
| 7 | IRC Staff | | | | | | | | | | 3 | 3 |
| | Total | 13 | 64 | 6 | 6 | 2 | 6 | 3 | 3 | 3 | 7 | 100 |

3.4. Data Collection and Processing

3.4.1. Data Collection Tools

In the data collection process major tools like; in-depth interview, questionnaire, semi structured discussion questions or check lists and secondary data sources were used and implemented. Both secondary and primary sources were used as source of data. The primary sources were collected from the house hold survey, form key informant interviews and from the focus group discussions. The secondary information was collected mainly from government offices and IRC field office. Both qualitative and quantitative data were collected from different sources. Quantitative data were mainly collected from the interviews and questionnaires. The qualitative data were collected from focus group discussion and personal observation at the field level.

a. Quantitative Data Collection

Household interview

An interview questions were prepared for the communities, especially for the head of the household preferably wife or adult women who had direct relation with the subject under study. The questionnaire was structured and includes predetermined questions. The collection of the data at field level was managed by three field assistances under close supervision of the researcher. The entire planned 64 sample HHs were interviewed.

Local leaders and government staff interview questionnaire

Interviews were conducted with different key informants that were believed to have the knowledge on the subject. The questions under this category were more of open type to get free response of the respondents. These respondents include government development agents, health extension workers, teachers, kebele administration members and elderly at the kebele level.

Questionnaire for regional and woreda government staff and IRC staff

A structured questionnaire was dispatched to government and IRC staffs that were well educated and well aware about the project. Also seven professionals; one RWEMB expert, two woreda WWO experts, one woreda health office expert and three IRC EH staffs were replied on the questionnaires.

b. Qualitative Data collection

Focus group discussion

A semi structured leading type of check lists were prepared for focus group discussion facilitation. A group of five to seven people were involved in a single FGD. The group

comprises from community leaders, WMC members, youth and elderly. The FDG was facilitated by IRC EH officer and all the recordings were taken by the researcher. Focus group discussions were conducted for women and men groups separately for each Kebele. Accordingly a total of six focus group discussions were facilitated.

Observation

Personal observation on the water sources, new water structures, sanitation and hygiene promotion activities at household level were applied as a tool that helped the researcher to see the changes gained as a result of the project intervention.

c. Review of Documents (Secondary Data Sources)

Secondary data about the background of the WASH project, its implementation and the impacts of the intervention on the community and the research area were collected from regional and woreda government offices and the IRC field office. On the desk review was undertaken on the project document, reports and evaluations. Data also collected from the documents obtained from the woreda and regional water offices.

3.4.1. Data Processing and Analysis

Four Master tables were prepared for each source of data collected; the first one is for the data collected from HH interview, the second is for data collected from kebele level (local) leaders and government staff, the third for the data collected from regional and woreda government staff and IRC field staffs and the fourth for information obtained from the focus group discussions. The data obtained from other sources is complementing the HH data and the data from the focus group discussion and observation is triangulated with data obtained from the interview and the questionnaires.

The collected data from interview questionnaires and from other tools were verified, edited and entered to the computer. The Data from HH interview were processed using computer soft ware. Descriptive statistics (tables, graphs and charts) depending up on the type of data were utilized in the analysis of the data and to present the results of the findings of the study. Triangulations of the different sources were also made for the curiosity of the information from the different sources.

CHAPTER FOUR: RESEARCH RESULTS AND DISCUSSIONS

4.1. Socio Economic Characteristics of Sample Households.

The socio economic characteristics include the basic information on sex distribution, age distribution, marital status, household size, education status, livelihoods, and income of the interviewed households. These characters are briefly described below.

4.1.1. Sex Distribution

From the total household interviewed, 67% were women and the remaining 33% were men. As women know better and directly attached with water and sanitation challenges in the household from the very initial stage of the data collection preference was made to interview women than men when ever available. See summary of sex distribution of respondents on Table 3.

4.1.2. Age Distribution

The age distribution of the respondents ranges from 15 to 80 years old with an average age of about 36 years old. The majority (74%) of the respondents were between 20 and 60 years of age. See detailed age distribution on Table 3 below.

4.1.3. Marital Status

From the interviewed respondents 81% were married, 14% were single, 3% divorced and 2% of them were widowed members of the household. From these interviewed household members, 55% were wives, 30% husbands, 12% children age greater than 15 years old and 3% relatives of the HH. See the detail on Table 3.

Table 3: Respondents Demographic Characteristics (Sex, Age and Marital Status)

| Characteristics | Category | Number of respondent | Percentage |
|-----------------|-------------|----------------------|------------|
| Sex | Male | 21 | 33 |
| | Female | 43 | 67 |
| | Total | 64 | 100 |
| Age | <20 Years | 9 | 14 |
| | 21-40 Years | 38 | 59 |
| | 41-60 Years | 12 | 19 |
| | >60 Yeas | 4 | 6 |
| | No Response | 1 | 2 |
| | Total | 64 | 100 |
| Marital Status | Married | 52 | 81 |
| | Divorced | 2 | 3 |
| | Single | 9 | 14 |
| | Widowed | 1 | 2 |
| | Total | 64 | 100 |

4.1.4. Household Size

The household size the interviewed respondent HHs ranges from 2 to 10 people per household with an average size of 5 persons in a single household. The majority of the interviewed households (63%) have a family size ranging 4-8 persons per HH. See HH size on Table 4 below.

Table 4: Household Size of Respondents

| HH Size Group | Number of HH | Total Members | Percentage(%) | Average HH Size |
|---------------|--------------|---------------|---------------|-----------------|
| 1-4 Persons | 28 | 91 | 28 | 3 |
| 5-8 Persons | 32 | 201 | 63 | 6 |
| >8 Persons | 3 | 28 | 9 | 9 |
| No Response | 1 | 0 | 0 | 0 |
| Total | 64 | 320 | 100 | 5 |

4.1.5. Education Status

About 77% of the intervened household members were not having any formal education, 11% of them attended primary education, 6% can read and write and the remaining 6% were secondary education levels. The educated respondents were mainly children age greater than 15 of the HH who interviewed in the absence of their parents. The summary of the respondents' education level is described on Table 5.

Table 5: Education Status of Respondents

| Level of Education | Number of Respondents | Percentage (%) |
|------------------------|-----------------------|----------------|
| No formal education | 49 | 77 |
| Read and Write | 4 | 6 |
| Primary (grade 1-8) | 7 | 11 |
| Secondary (grade 9-12) | 4 | 6 |
| Total | 64 | 100 |

4.1.6. Livelihoods

The main economic activities that interviewed households engaged is crop farming and gold mining or a mixture of both. From the total households interviewed 81% are mainly involved in crop farming and small livestock rearing, 17% in farming and traditional gold mining and the remaining 2% in bee keeping. See Table 6 below for the detail.

Table 6: Major Economic Activities of Respondent Households

| Economic Activity | HHs | Percentage (%) |
|-------------------------------------|-----|----------------|
| Farming/Crop production | 50 | 78 |
| Mixed Farming(crop and livestock) | 2 | 3 |
| Apiculture- traditional bee keeping | 1 | 2 |
| Farming and traditional gold mining | 11 | 17 |
| Total | 64 | 100 |

4.1.7. Income

The income of the interviewed HH varies from 20 ETB to 500 ETB per month for whom that knows and responded the amount of their monthly income. Nearly half of the respondents were not responding to this question. From those who replied, majority earn from 200 ETB to 300 ETB a month. See for the detail from Table 7.

Table 7: Monthly Income of Respondents Households

| Monthly Income/ETB | Respondents | Percentage (%) |
|--------------------|-------------|----------------|
| <100 | 8 | 13 |
| 101-200 | 7 | 11 |
| 201-300 | 19 | 30 |
| >300 | 1 | 2 |
| No Response | 29 | 45 |
| Total | 64 | 100 |

4.2. Water Supply System

4.2.1. Sources of Drinking Water

The major sources of drinking water in the target community was from unprotected water sources which include water from rivers, streams, unprotected springs along river side, and ponds. About 80% of the communities under this study have been fetching drinking water from these sources. Only 20% of the community used to get water from hand pumped shallow wells. This figure has changed a lot after the project intervention in these communities. To date from the interviewed households about 78% get water from safe water sources. This improvement is due to the fact that the project established seven new shallow well with hand pumps and rehabilitated one hand dug well with hand pump in the target communities. As the remaining 22% of the interviewed HHs responded they are getting water from both the hand pump and other unprotected sources the percentage

those using from improved water sources could be even more than the stated figure. This may be true as the project final report says the total number of HHs using from improved water sources reached 87% after the project intervention. Moreover as part of the project intervention roof water harvesting schemes for two schools and one health post with a storage capacity of ten thousand liters have been constructed.

The sources of water for the target communities before and after the project intervention as described on the project final report can be seen from the following Table 8.

Table 8: Sources of Water Before and After the Intervention

| Kebele | Gott/ Village | Sources of Drinking Water | | No of People Served |
|-----------------|------------------|-------------------------------|---|---------------------------|
| | | Before the Intervention | After the Intervention | |
| Komes hga 27 | Gott 3&4 | Unsafe Stream | Shallow well fitted with Afridev Hand pump | 468 |
| | Gott 5&6 | Unsafe stream | Shallow well fitted with Afridev Hand pump | 352 |
| | School | No water | Rain water harvesting tanker | 188 |
| | Health post | No water | Rain water harvesting tanker | 15 |
| Komes hga 25 | Gott 3 | Unprotected HDW | Rehabilitated with Afridev Hand Pump | 330 |
| | Gott 1&2 | Unprotected open well | Shallow well fitted with Afridev Hand pump | 810 |
| | Gott 3&4 | Open well and river/stream | Shallow well fitted with Afridev Hand pump | 504 |
| | School | No water | Rain water harvesting tanker | 383 |
| Ateto | Gott (1&2) | Open well and river/stream | Shallow well fitted with Indian mark II Hand pump | 234 |
| | Gott 7&8 | Unprotected open well | Shallow well fitted with Indian mark II Hand pump | 257 |
| | Gott 3&4 | River | Shallow well fitted with Indian mark II Hand pump | 368 |

Source: IRC, WASH Project final report (draft)

From the response of interviewed HHs, one can easily understand that the sources of drinking water for the majority of the HHs before the intervention was from open wells, rivers and streams while after the intervention the sources of water for the majority of the HHs is changed to shallow well with hand pump (HP). See the reply of the interviewed HHs on the water source before and after the project intervention summarized on Figure 2 below.

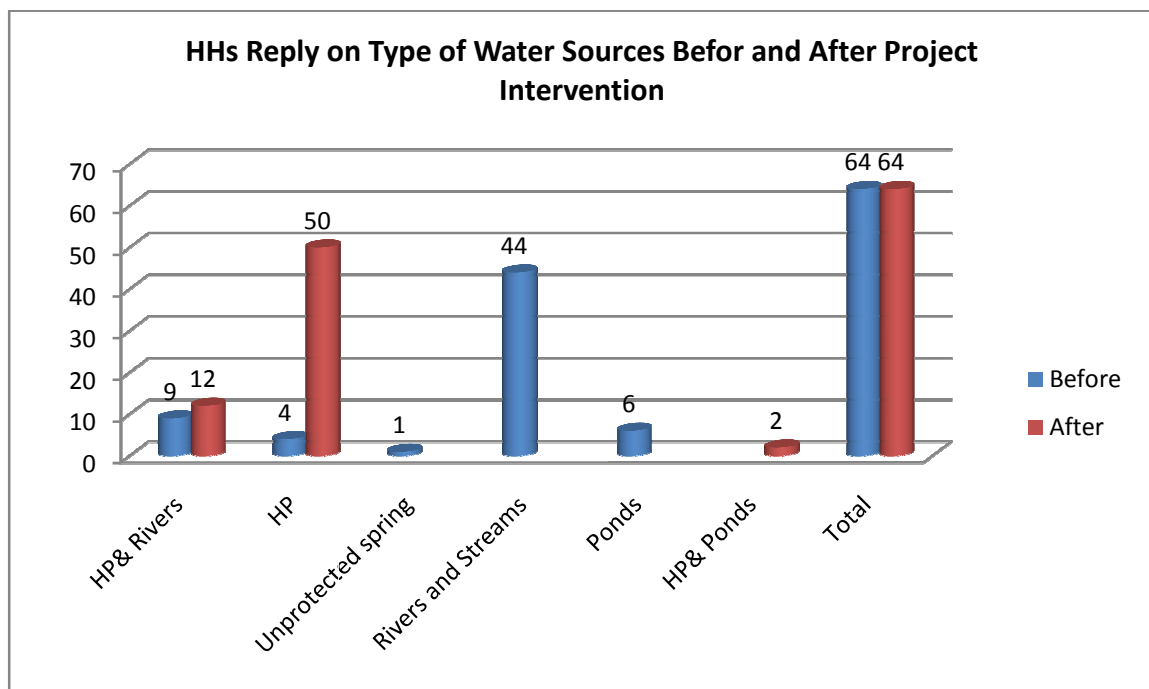


Figure 2: HH Interview Response on the Water Sources before and after the Project Intervention.

The following three pictures in one (Picture 1) also shows how a girl is fetching water from open and unprotected well. There are a lot of containers (“Jarry cans”) waiting for their turn. This water source in addition to its uncleanness, it is dangerous for the lives’ of the water collectors. They may have a chance to inter into the well. Moreover with these existing problems the water could not last throughout the year and as a result the villagers are exposed to excavate another well at a far distance place to get water.



Picture1: Unprotected Well and How a Girl is Fetching from it in Komeshiga 25 Kebele.

Source: Photo shot by EH team of IRC Assosa Field office

4.2.2 Accessibility and Availability of Drinking Water

The water from those unprotected sources could not last throughout the year in some villages. In these situations the dwellers were required to go further distance to get water especially in the dry season. In complementing this 27% of the interviewed HHs revealed that the water from these sources is not lasting throughout the year. From those respondents the majority of them mentioned that the water from these unprotected water sources serve only 6-9 months in the year, which means the last 3 months are seasons that people move far distances to get water. From the women focus group discussion in Ateto Kebele it was possible to understand that as the distance increases the challenge is not only time taking but also women were exposed for sexual abuses while they were traveling far distance to collect water.

Water access is drastically improved after the project intervention. The majority of the communities get water within one kilometer of distances. Not only the distance is reduced but also there are no long queues to wait for fetching water, violence among neighbors reduced and sexual abuse on women and girls reduced. From the interviewed HHs, 97% witnessed that the access to drinking water is improved and only 3% replied the access is

the same as previous. These HHs may be from those HHs that previously have the access for HP water sources. See the Pie Chart (Figure 3) below for the response of the HHs.

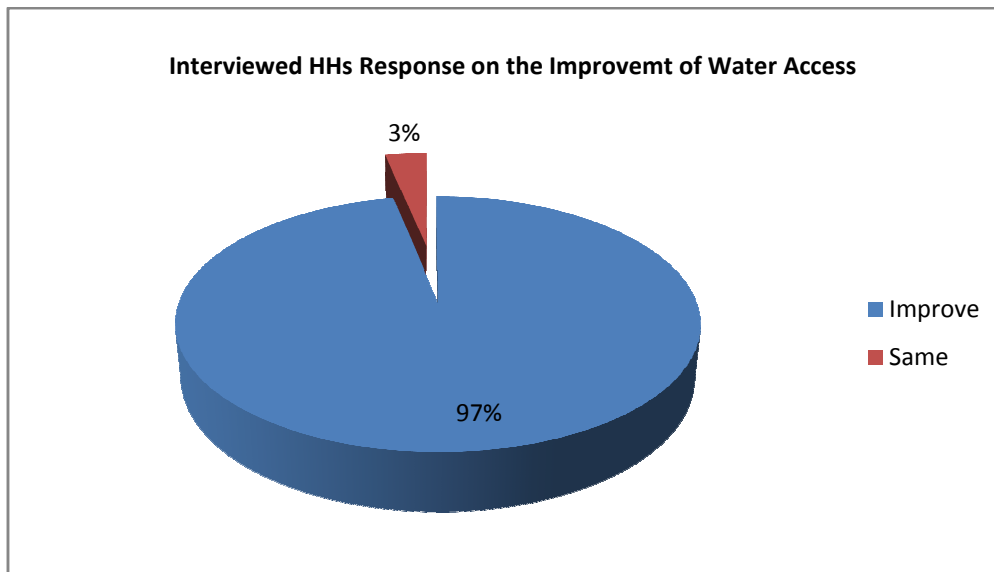


Figure 3: Interviewed Households Response on the Improvement of the Water Access

4.2.3. Time Required for Water Collection

Before the project intervention, the time required to collect water varies from 10 minutes to an hour. The majority (48%) of the respondents said it takes them 30 minutes to one hour to collect water. This shows the majority of the villagers collect water from far distances away from their villages. Moreover the long queue for waiting their turn takes even more time than the travel. From the women focus group discussion in Komeshiga 27 kebele respondents mentioned that in some cases it takes them even half a day to reach their turn to fetch a single pot of water because of long queue.

The time required for water collection after the intervention ranges from less than 10 minutes to 30 minutes. The majority of the respondents revealed that they can collect water within 10 minutes (74%). The remaining 12.5% respondents indicated that it takes 10-15 minutes and 12.5% of the dwellers in some villages a little far from water points said it takes them 15-30 minutes. This time reduction is mainly due to the fact that the

improved water points are constructed near villages and the problem of long queue to wait for their turn is solved. See Table 9 for the interviewed HHs response on the time required before and after the project intervention.

Table 9: Time Required for Water Fetching

| Time group | Before Intervention | | After the Intervention | |
|---------------|---------------------|------------|------------------------|------------|
| | Respondents | Percentage | Respondents | Percentage |
| <10 minutes | 12 | 18.75 | 47 | 73.44 |
| 10-15 minutes | 9 | 14.06 | 8 | 12.50 |
| 15-30 minutes | 11 | 17.19 | 8 | 12.50 |
| 30-1hour | 30 | 46.88 | 0 | 0.00 |
| Don't know | 2 | 3.13 | 1 | 1.56 |
| Total | 64 | 100 | 64 | 100 |

4.2.4. Functionality of the Water Structures

In addition to their limited numbers, most of the water structures before the intervention were either produce very small amount of water or were none functional. For instance one hand dug well with hand pump in Komoshga 25 kebele was not functional. The project in addition to constructing new structures was responsible to rehabilitate some of the previous non functional water structures. While respondents asked the functionality of the newly erected schemes by the project, 87.5% replied that all the newly constructed structures are functional while 12.5% of the respondents mentioned the new water structures have some technical problem. The reasons for malfunctioning of the structures was mainly because of the handle of the hand pump have problems to pull water from the well. From focus group discussions and personal observation it was also possible to understand that the handle of one of the newly established shallow well in Komoshiga 25 kebele is tight to move and the discharge amount is very small and similarly in Komeshga 27 kebele the handle is a little stronger to move and needs more energy to pull the water

from the depth of the SW. Both can be easily maintained to serve the community in their full capacity.

As functionality of the constructed water structures for longer period is highly associated with the sustainability of the project, it needs a great attention by all concerned bodies including the government, the community and the NGOs.

4.2.5. Responsibility of Water Fetching in the Household

Water fetching in the study area is mainly the responsibility of women and girls. Male, especially fathers totally are not responsible for water fetching unless some problem with the women and girls has existed, like health problem or they are not at home during that specific time. From the interviewed households 67% replied water fetching for the HH is the responsibility of mothers, 19% of the respondents said it is the responsibility of both mothers and girls, 11% of the respondents said that water is collected by young girls and only 3% of the respondents said water fetching is the responsibility of young boys. From these figures we can derive that a total of 97% of the respondents replied that the responsibility of water fetching is female's, for both mothers and young girls in the house. From this figure it is possible to conclude that how heavy is the work load on females in the community. The response obtained from the HH interview is shown on Figure 4.

For the question that asks about the involvement of children's in water fetching, 70% of the interviewed respondents said 'yes' while only 30% of the respondents replied 'no'. From those who said 'yes' again given a choice for which sex (girls or boys), 98% of them said girls.

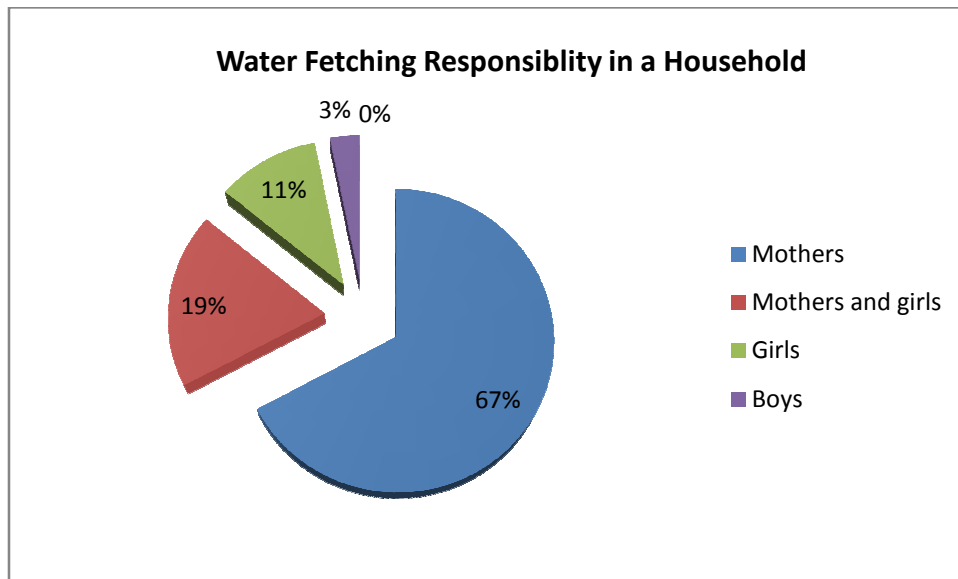


Figure 4: Response of HH Interview on the Responsibility of Water Fetching

4.2.6. Household Water Consumption/Quantity

The daily water consumption level of the households in the study kebeles was very low especially before the intervention. Only 28% of the HH interview respondents utilize more than 40 liters of water a day and 48% of the respondents said they consume between 20 and 40 liters a day. The remaining 24% of the respondents said they consume even less than 20 liters a day. The daily water consumption for single person ranges 6 to 8 liters with an average about of 7 liters. This is significantly lower than the standard which is 20 liters per person per day. Low level of consumption of water has an impact on the health situation of the community. If the HHs are using minimum amount of water in a day it is an indication that they are not keeping their personal hygiene properly, not drinking enough, not keeping sanitation and these all led them to a health problems.

The daily consumption rate has significantly increased after the intervention, though it is still lower than the standard. The information obtained from the interviewed households revealed that 74% mentioned their HH daily consumption rate is more than 60 liters a day, 21% of the respondents replied their daily water consumption for their household

ranges from 40 to 60 liters a day and only 5% of the respondents replied they consume less than 40 liters per day for their household. The daily per capita water consumption after the project intervention ranges from 8 liters to 14 liters per person per day with an average daily per capita consumption of 10.2 liters per day (final report of the project, 2013). The Result of daily water consumption from HH interview is shown on the bar graph (Figure 5) below.

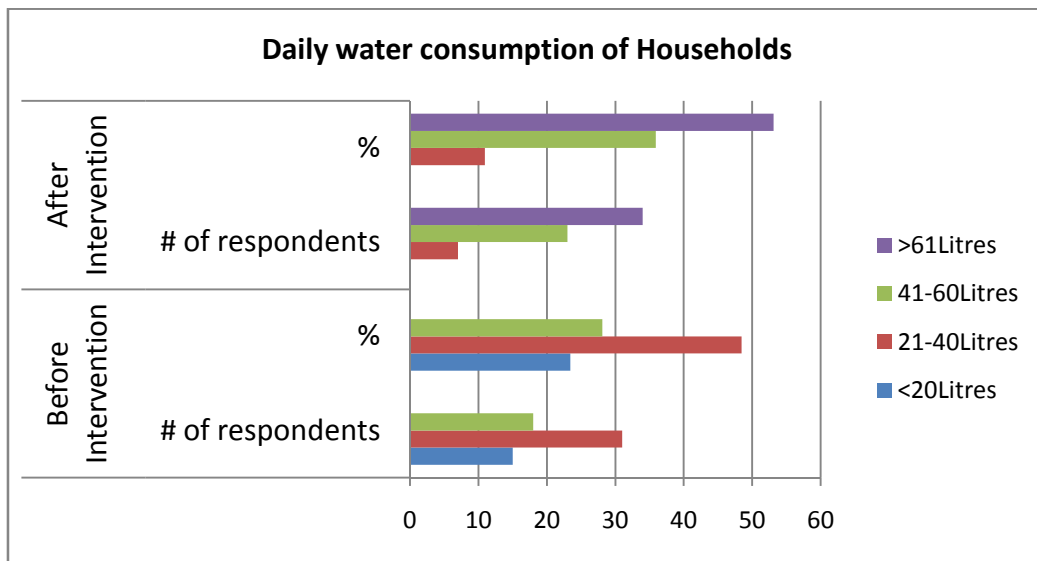


Figure 5- Daily Water Consumption per Household before and after the Project Intervention

4.2.7. Water Quality

The information obtained from the HH interview, focus group discussion and key informants revealed that the quality of water from those sources before the project intervention was very poor. Most of the water sources were not protected. Except for some protected sources animals and human beings use from the same sources of water. The water was highly polluted with animal dung and other dirt materials and the turbidity level was high. From the intertwined households 86% realized that the quality of water was ‘poor’ and only 13% of the interviewed HHs who uses from HP sources mentioned the quality was ‘good’. As a result of poor quality the communities were suffering from

variety of water born diseases which includes Diarrhea, typhoid, and skin diseases. In addition, the water colour and test from those unprotected sources was not good enough for drinking.

The quality of water has considerably improved after the project intervention. Most of the community members have an access for potable water from protected sources. Almost all the information sources proved that water quality in term of colour, test and healthiness improved. Almost all the interviewed HHs (100%) replied the water quality is improved after the project intervention. From those who replied on the water quality improvement; 73% replied the water from the new structures is 'best quality' and the remaining 27% said the water is 'good quality' and no one mentioned 'poor quality'. The quality of the water is coupled with a chemical treatment for the newly established water sources. Chlorine is added to the water and it makes the water free of micro organisms. The response of the interviewed HHs on the quality of water before and after the intervention is shown on Figures 6 below.

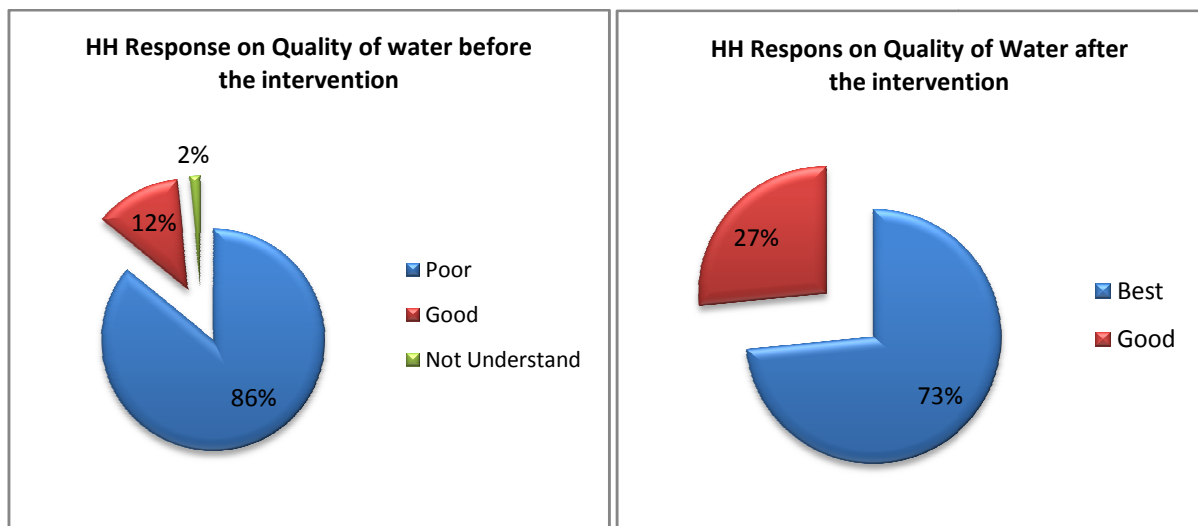


Figure 6: Household Response on the quality of water before and after intervention

4.2.8. Water Treatment

The experience of the community under study for water treatment at home level before the intervention was very low. Only about half of the interviewed HH members replied that they treat water at home or during fetching. From those HHs who replied “yes” for treatment of water, only 8% apply water agar (a chemical) and 26% boil water for drinking. The remaining 66% apply methods like filtering or staining with cloth which are not helping to avoid micro organisms.

The water sources of the new intervention are treated with chemicals, chlorine is applied in the water system and the water is safe for drinking and free of micro organisms. Ninety five percent (95%) of the respondents of the interviewed HHs realized that chemical/chlorine is added every time in the new water sources and witnessed that the water is safe for drinking. From the final project report it is possible to understand that water quality test has been conducted for each water system. According to the report, “The chemical test results showed the appropriateness of the water from all sources for human consumption. All water schemes are disinfected by chock chlorination method before they are put to service for the communities (ICR, 2013).”

4.2.9. Level of Satisfaction

The level of satisfaction of the user communities on the newly constructed interventions is significant. They were mentioning that time is saved to be used for other activities, the quality and quantity of water improved, and the health of the community significantly improved. Households interviewed to rank their level of satisfaction from the three options of levels of satisfactions (High, medium and low), 80% of the respondents chosen ‘high’ level of satisfaction and 20% said medium level of satisfaction. The main reason for those said medium level of satisfaction is the functionality of two of the new

structures as mentioned earlier has some problems. The response on the level of satisfaction of the interviewed HHs is shown on Figure 7 below.

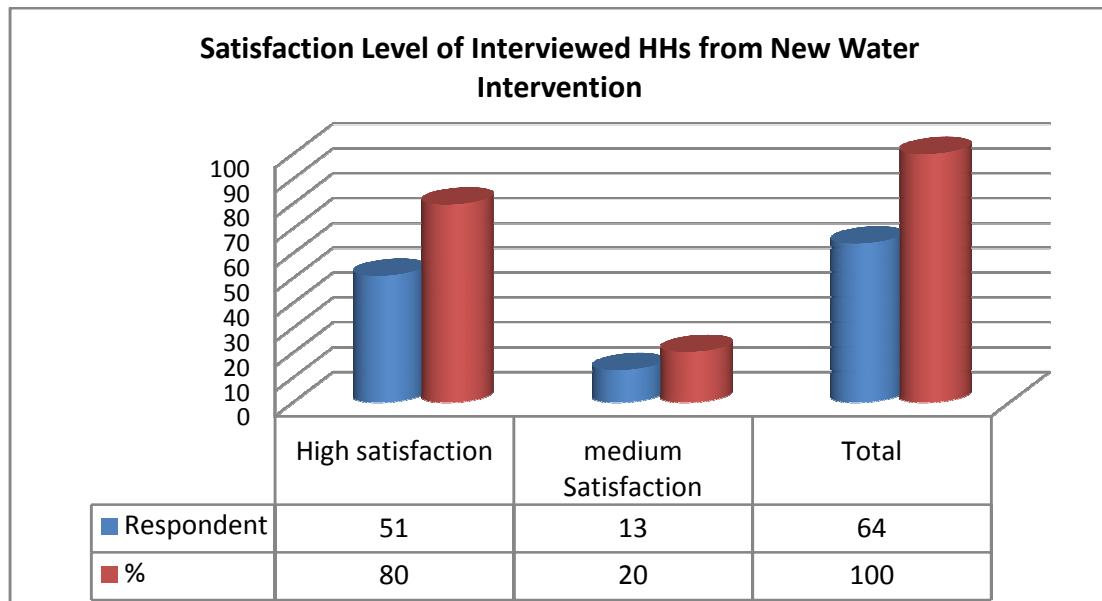


Figure 7: HH Response on the Level of Satisfaction of the Intervention

4.2.10. Payment for Water

The community members do not pay any fee for the water service they get. Every member of the village has a right to fetch water based on the time schedule without any coin to pay as water fee for the service gained. They rather contribute one to five ETB per month. This helps to ensure cost recovery system for operations and maintenances of water schemes. The contributed money is used for purchasing spare parts for maintenance of the water structures and chemical for water treatment. This idea is supported by community group discussion, key informants and the HH interview. From the interviewed HHs about 91% revealed that the contribution is used for maintenance, purchasing of chemical and key lockers of the gate of the fence of the water structures. The remaining 9% said they don't know for what purpose the money is used.

4.2.11. Management of Water System

The newly constructed water structures are managed by a management committee. A Seven member management committee is established for each structure. The water management committee is elected by the community members who are fetching water from that specific HP. The committee is responsible to collect monthly contribution from the members, to keep the cleanness of the water structures and the surrounding, to maintain of water structure, to fence the structures, to arrange schedules for members to take attendance while water is fetched. At the kebele level there is water board led by the kebele chair man. The board supervises the task of each water management committee. Moreover there are a trained two water technicians for each structure who are responsible for the maintenance of the water supply system. Community members are also responsible to be assigned as attendant during water fetching time in a round bases. This type of structure and involvement of the community members in the water system is believed to contribute a lot for the sustainability of the water system. From the total interview HHs, 98% agreed that the water structures are managed by the water management committee and the community members and the remaining 2% mentioned that the water structures are managed by government.

The woreda water office is also responsible in the management of the water systems, in terms of maintenances and giving trainings for water technicians and water committees. The office is also responsible to follow all water related activities being on the top of water boards and responsible for the expansion and development of water supply to rural communities.

There are early indicators when more women are engaged, water schemes are better managed. By empowering women to participate in every stage of the project, women

voice their WASH concerns, making the projects more suitable to their needs. According to the project final report on average, 43% of WMC members are women.

4.2.12. Water for Schools and Health Posts

Schools and health posts in the study area does not have any water sources in their compounds. Students could not get water for drinking and hand washing especially after the use of toilets and before food. Interviewed school teachers expressed their view that there was no any water in the schools. Students and even teachers were suffering from thirst because of the lack of water during class time. As the place is very hot, the demand for water is very huge. In all the focus group discussions members of the community mentioned the same. Their children were suffering from absence of water in school hours.

Similarly there was no any water source in the health posts where treatments are given. Water is very important to provide the appropriate service such as washing hands before and after diagnosing patients, treating wounds, taking tablets, etc. It was even difficult to wash treatment utensils and clothes and it had a negative impact on the proper provision of the health service in rural areas.

The project installed three roof water harvesting tankers and hand washing structures for schools and for health post in Komoshiga 25 and Kemesha 27 kebeles, which is for one school in Komeshiga 25 kebele and for one school and one health post in Komesha 27 kebele. Each water tanker has 10,000 liters of capacity. These structures collect water from the roofs of the school classes and health posts during the rainy season to be used in the dry season. The structures can also serve to track water from shallow wells to be filled based on the availability of finance. This roof water collecting technology will solve the problem partially for both the schools and health posts.

4.3. Sanitation and Hygiene

Hygiene promotion and sanitation was the other component of the project. Basically the soft element of the project was highly dominant than physical constructions and hence in this component awareness creation, mobilization of communities to have their own private latrine and communal latrine, keep their house clean and hygienic personality were included.

4.3.1. Access and Type of Latrine

Even though the majority of the intervened HHs replied they had pit latrines before the project intervention the latrine was not covered and sheltered and some were using neighbors' latrines. The community was not also well aware about the importance of using toilets for the improvement of their health. The initial IRC survey reveals that the sanitation coverage was only 60%. This figure includes the available latrines without considering its quality. However the coverage for hygienic latrines was only 32% according to initial survey (IRC, 2011). The information obtained from focus group discussion and key informants showed the same that the number was few and quality of the toilets was very poor. The health extension worker at Ateto kebele, Fatuma for instance, mentioned that 'use of toilet before the project was very low, people were defecating in their compounds in open spaces especially after the sun set following darkness'. She added 'Faces of children were in every space even in the houses'.

With the project intervention coupled with the government health extension system, currently nearly all the HHs of the study area have private pit latrine. The remaining HHs uses either in neighbors or in communal latrines. The quality of latrine may vary from home to home. All interviewed HHs mentioned that they have their own separate covered and sheltered latrine in their compound. Nobody in the community defecate outside of the

latrine. If someone found doing it he will be penalized according to the rules set by the villagers. Even though all interviewed HHs replied they have pit latrine, the final report of the project showed that currently 84% of the HHs in the target community's have hygienic latrine. All the three kebeles graduated and have a bill board indicating that particular kebele is outside defecation free (ODF).

The project also developed VIP latrine for two primary schools at Komeshiga 25 and Komeshiga 27 Kebeles. A total of four VIP latrines (blocks); two for each school, one for girls and the other for boys were constructed. Each VIP latrine with eight stances and for each blocks 175 liters capacity hand washing facility is installed. These latrines significantly reduced the problem of latrine of the schools. Together with the roof water system installed in these schools the sanitation and hygiene of school community is getting improved. All the interviewed teachers from these schools as key informants agree with the improvement of water supply and sanitation in the schools.

In sum, according to the project final report the latrine coverage in these kebeles reached to 94%, of which 84% of the constructed latrines are said to be improved and hygienic. The increment from 32% of hygienic latrines at the beginning of the project to 84% means a lot and great achievement in the very short life of the project. Some of the private pit latrines constructed by the HHs are shown on Picture 2 below.



Picture 2: Some of the Private Pit Latrines constructed in the Target Communities

4.3.2. Awareness on Sanitation and Hygiene and Approach

The awareness of the community on sanitation and hygiene was very low. People defecate in open spaces and residence areas. Farm lands were full of human excreta. Children defecate even in the house and their excreta stay long without removing it. Human beings and animals share the same room. There was no any segregation for bed and cooking room. Cooking materials were not having shelves to put and also were not washed every time. In these communities, it was not a common practice to wash cloths and to take path regularly because of lack of knowledge and shortage of water. They don't practice washing hands after defecation, before feeding children, before food preparation and eating. The breeding of house flies and mosquitoes exposed them for malaria, diarrhea and related diseases.

The communities indicated that they get the awareness of sanitation and hygiene from the project staff and the health extension workers of the government. From the interviewed HHs, 98% said they have got the awareness from these agencies and only 2% said from mass media. From all the focus group discussion, it was possible to understand that the community liked the approach implemented by the project, which is CLTSH.

The IRC and the government launched the two-phased CLTSH approach (pre-triggering & post triggering). In the pre-triggering phase, an amenable political, economic, and social environment for CLTSH was created through the analysis of current favorable and challenging conditions and practices, both social and cultural. To set a date for triggering activities to commence, pre-triggering also examines timing, seasons, and setting. In the triggering phase, participatory CLTSH exercises were completed with the community. The activities were designed to help communities realize the benefits of open defecation cessation and make decisions about how to create their own ODF village (IRC, 2013).

4.3.3. Cleaning Latrine and Hand Washing Practice and Knowledge

Most of the households are not still cleaning their Latrine frequently and regularly. From the interviewed HHs, 49% clean their latrine once in a week, 31% every other day and the remaining 20% said every day. This is due to the fact that the material of the floor is usually either wood or bamboo covered with soil which is not easy to clean ever day.

The awareness of hand washing practice of the community significantly increased after the project intervention. From the HH interview and focus group discussions, it was possible to clearly understand that the majority of the community members are aware of the importance of hand washing. All HHs interviewed (100%) replied that they practice hand washing at different events (critical hand washing times). The major critical times that the community members wash hands includes; before feeding children, before eating food, after the use of latrine, before food preparation and after cleaning of children. From the total interviewed HH members more than 84% indicated they wash their hand for all the indicated events. The remaining about 15% realized that they wash their hands at least for the three events.

As far as hand washing practice after the use of latrine is concerned, the majority (93%) of the respondent HHs replied that they are washing their hands and 7% of the respondents said they wash only some times. The station and water type for hand washing are usually jugs, small 'jerrycan', tippy tap or similar items at station. Results from interviewed HH respondents showed that; 44% use tippy tap, 27% small jerry can, 20% 'alberik' (locally clay made water container) and packed water plastic containers and the remaining 9% use jug at station for hand washing after the use of latrine. The type of detergent for hand washing used by the majority is soap (92%), the next is ash and the last is soil/sand, which together account 8% of the interviewed HHs.

Comparing with the status of hand washing at the beginning of the project which was almost none with the existing situation (after the project) the improvement is very significant. Figure 8 below shows the response of interviewed HHs on hand washing station after latrine.

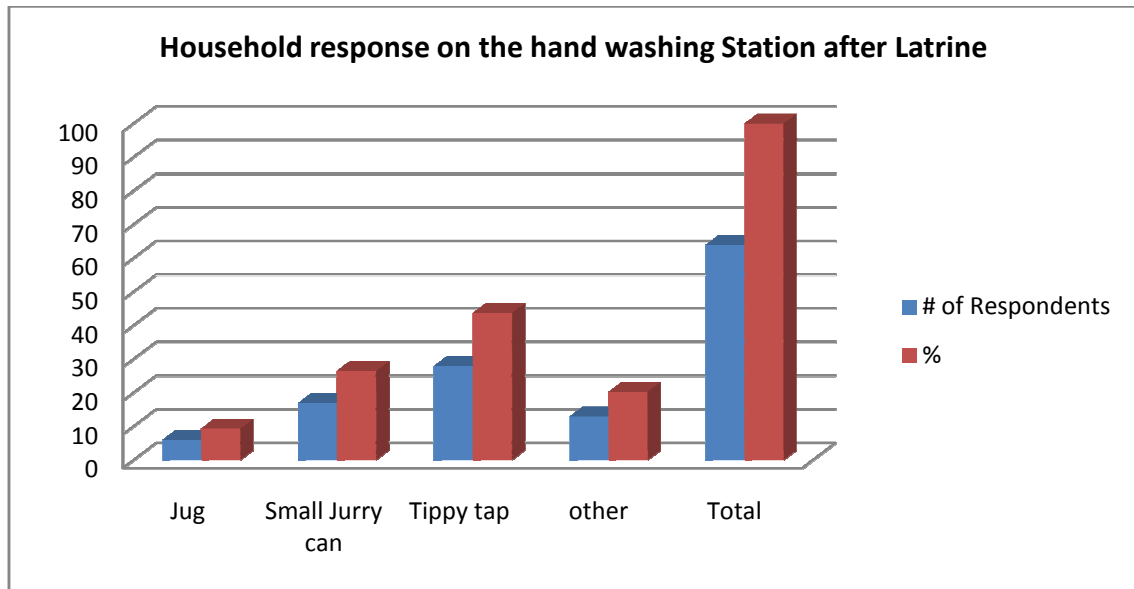


Figure 8: Interviewed HHs Response on Hand Washing Station after the Use of Latrine

4.3.4. Waste Disposal

Majority of the community were discarding daily house dry wastes and animal dung in open spaces, usually in their compound or nearby places. This has created a good opportunity for flies and mosquitoes to breeding in their vicinity and this in turn will have a significant impact on their health. The compounds and the vicinity were not clean, full of bad smells and people were exposed to respiratory diseases like common cold. Children do not have clean spaces for playing.

After the awareness is created by the project and government health extension workers the situation is improved. Most of the households have waste pits in their compound. Households that do not have waste pits collect trashes together and burn it regularly. This

has avoided the bad smell in the area, reduced insect breeding and enabled to have clean spaces for children to play and people in neighborhood to take a rest and talk each other in the free spaces and under tree shades. As a result, the occurrence of diseases especially respiratory, malaria and diarrhea reduced significantly. In complimenting this 55% interviewed HHs replied that they have waste discarding pits and 44% collect and burn it in their compound regularly.

4.4. Inadequate Water Supply and Poor Sanitation Related Diseases

The most common diseases related to inadequate water supply and poor sanitation service in the study area were typhoid, diarrhoea, malaria, worms and skin diseases. Children and lactating mothers highly affected by these diseases. According to the information found from HEW, Diarrhoea affects children especially those children below five years of age. Intestinal worms were also common among children. Malaria is a common disease that emerges as epidemic during the beginning and the ending seasons of rain fall. These seasons allow mosquitoes to breed easily as the water is collected in every place. Almost 75% of the interviewed HHs frequently mentioned that typhoid was the most common disease in the area because of poor sanitation and poor hygiene. Diarrhea and skin disease follow the next frequency. See the rate of occurrence of the interviewed household's responses on the following Figure (Figure 9).

The occurrence of disease have reduced after the community provided with the awareness to keep their environment clean, use latrines, keep their personal hygiene, and drink water from protected sources. Discussions made with key informants and focus group discussion revealed the same. A focus group participant women from Komoshiga 27 Kebele said that, “thanks for the project, currently our health is protected, children are healthy and happy, no malaria and diarrhea as previous times”. The health extension

worker, Abebu from Komeshiga 25 Kebele mentioned that “the health situation of the community she is serving is improved especially for children; they are not coming to our health post to get health services like previous times as their chance to be exposed to diseases is highly reduced”.

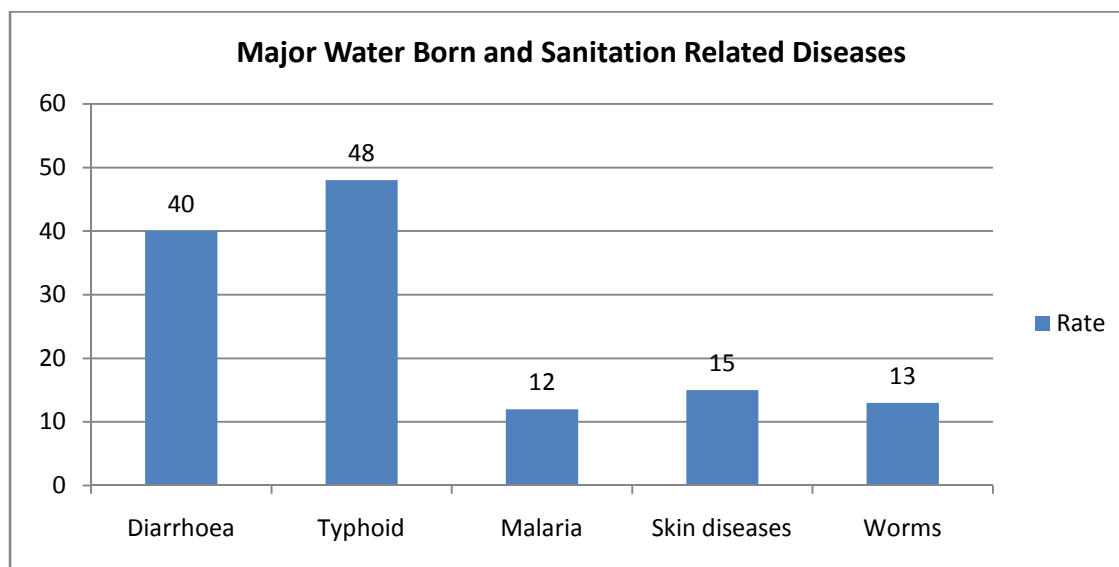


Figure 9: HH Responses on Types of Inadequate Water and Poor Sanitation Related Diseases

Moreover, from the interviewed HH members, 95% of them witnessed that the occurrence of diseases in their area has decreased as the result of the project intervention and the awareness created.

As a result of reduced disease occurrence; time is saved which was used for taking care of sick people, which in return helped to increase productivity of labour, medical expenditure reduced and above all family happiness increased.

4.5. Community Participation and Sustainability

According to the project final report (Jan 2012), to insure sustainability of the project the IRC has designed and implemented the project with close coordination with existing government’s health and water sector structures. Both sectors are structured up to kebele

levels. The kebele HEW and water technicians are working closely with kebele level natural leaders. Health and water professionals at woreda level are providing technical and material back up to kebele level WMC, HEW and water technicians. For the hardware activities IRC has trained scheme care takers from the community for each newly constructed and rehabilitated water schemes, who will maintain minor maintenances. The project also trained the wereda water technicians for major maintenances and for the software issues. The elected WMC were closely working with the HEWs and IRC staff. This structure helps the government/HEWs to maintain the already observed change and scale up to other villages and adopting other hygienic behaviors.

Capacities of woreda water and health office experts, community leaders are built through trainings to sustain project results. Water system management committees established for all water schemes and provided trainings on operations, maintenance and management of their water schemes. Water scheme management by laws are designed and agreed by water point users. This by law document is produced and kept for use in custody of water board chair persons. Out of seven WMC members at least three are women. Local authorities and community members have actively participated in all stage of the project cycle. Community members in coordination with woreda water office experts identified, selected and prioritized implemented project activities. To analyze access and coverage gaps of water and health services in the targeted kebeles, developed and rehabilitated water and sanitation schemes are mapped and shared with regional, zonal and woreda water and health offices. To ensure cost recovery system for operations and maintenances of water schemes beneficiaries are contributing cashes on monthly basis. Monthly contributions of water users ranged from 1 to 5 ETB based on the decision of the members. Water collection hours are also agreed by the communities and community members agreed to be an attendant of water points during water collection hours in turns

(Project report, Jan. 2013). The duties and responsibilities of the different actors are described on Table 10 below.

Table 10: Duties and Responsibilities of the Different Actors

| Activity | Organization | Local Government | Community | Other Partner |
|--|---|--|---|--|
| Water scheme operations and maintenances | The IRC provided trainings for WMC and water office experts and provided fast moving hand pump spares for one year. | Woreda water office oversee the smooth operation of water schemes, make spares available for sale at reasonable costs, and provide technical back up for major breakdowns. | Communities are participated in the contribution of money in monthly basis and WMC are responsible for overall management of water schemes. | Regional water bureau is in charge of providing directions on policies and strategies. |

Source: ICR Assosa Field Office, EH Team, Project end report (Jan 2013)

The information obtained from the focus group discussion and key informants showed that community members were participating in the project implementation. During water structure construction, community members contributed in the form of cash, kind (like collecting construction stones) and labour for moving construction materials from where it is dumped to the actual site of construction where there is no access for vehicles that transport material to reach the construction site. The community was also responsible to fence the water structures by collecting local materials from their own and by their own labour. The community is fully responsible to excavate their private and communal latrines and waste discarding pits after the awareness is created among them. They are responsible to construct the cover of the pit and the house or shelter of the latrine with their own expenditure. The community is responsible to protect the water structure from animals, keep it clean regularly in order to avoid collected dirt water, mud and grasses that favor the breeding of insect. Members of the community also participate in keeping attendance during water fetching hours. From the interviewed HHs almost all mentioned

that directly or indirectly the community participated in the implementation of the project from the very planning to the construction and during utilization of the structures. In this regard, 62.5% of the interviewed HHs mentioned that they were participated by labour contribution and the rest contributed either in kind or cash.

Like the water committee there are established sanitation promotion committees consisting of five persons in a single village. The committee members are selected by the community residing in the particular village. They are responsible to mobilize the community to properly use their toilets, to protect the area from outside defecation, keep their dwelling surroundings clean, and take measures for those who violate the rules set by the members.

Risk factors also identified for the sustainability of the structures. From the final report of the project the major risk factors mentioned are: lack of spare parts in local market and shortage of finance by woreda water office to mobilize woreda experts to follow up the structures and technically support the trained water technicians. This risk factor was supported from the focus group discussions of the community that the follow up and support from WWO is very low.

4.6. Impacts of the Project Intervention

Provisions of adequate drinking water and sanitation services to rural community have significant importance on their live improvements. Improved Water supply to the rural community in addition to time saving and improving the access, it have a significant effect on the economic, social, and environmental benefits to the community. Similarly hygienic and improved sanitation services for rural communities will have great importance in the live improvement of the community in terms of economic, health, psychological and environment benefits. This has been supported from the responses of

all sources of information of the study; including interviewed HHs, focus group discussants and key informants.

Information obtained from the HH interviewees revealed that almost 98.5% of the respondents mentioned that living condition of their family is improved due to the benefit they get from the project intervention and only about 1.5% of the respondents mentioned that they don't see any change on the living condition of their family. Focus group discussants especially women group emphasized the live changes obtained as a result of the intervention. They mentioned that their family health is getting improved, accessible water saved their time to be used for other activities like they can go to market and earn additional income, they can visit friends, have time to go to church or mosque and to other social commitments. They mentioned currently there is no fight among women because of long queues in waiting their turn during water fetching. They can keep their children clean because of the availability of water in the nearby vicinity, they also mentioned they are proud psychologically for having latrines that keeps their privacy, there is no dirt and no insect breeding, no bad smelling and open fields are clean for children to play. Let us see the detailed impacts one by one below.

4.6.1. Economic Impacts

Improved water supply system and sanitation service have produced significant economic impact on the targeted rural community. The project intervention helped the community a lot in terms of time saving. As a result of the accessibility to improved water sources, time is saved and this time can be used for productive purposes and contributed much for increased productivity and production. Women for instance got extra time for other economic activities; they can go to markets, can involve in petty trading and increase their time of participation in agricultural practices. Healthy people will have improved

work power for better production. The other thing mention in its economic benefits is they don't spent more time for taking care sick people, moving them to far health services and also reduced medical expenditure of the community.

Earning additional income and reducing unwanted expenditure have a contribution to the community in their food security status. Involvement of the HH members on agriculture activities for longer time in a day will increase production, and this has contributed lot to attain the food security of the community. Women involvement on other economic activity also increases the income of the HH which directly contribute for food security status of the HH.

From both the focus group discussion and from HH interview the same information was obtained on the economic importance of the project intervention. Four options which include to choice from; save time to boost agricultural productivity and production, improved health improve work power, reduced medical related expenditure and women have time for other economic activity given to the HH interviewees to mention for the economic benefits they obtained, 66 % of interviewed HHs mentioned two of these or more, 25% mentioned at list one of these economic benefits and 9% did not mentioned any of the choices given to them. From these figures we can see that 91% of the interviewed HHs indicated that community members have gained economic benefits from the project intervention. The frequency replied by interviewed HHs for each of the economic importance is displayed on Figure 10 in the form of column chart.

From the chart we can deduce that the most frequently mentioned economic benefit by interviewed HHs was increase in production and productivity. About 80% of the interviewed HH mentioned increased production, 48% reduced medical expenditure, 45%

improved work power and 38% of the interviewed rated for women earn additional income.

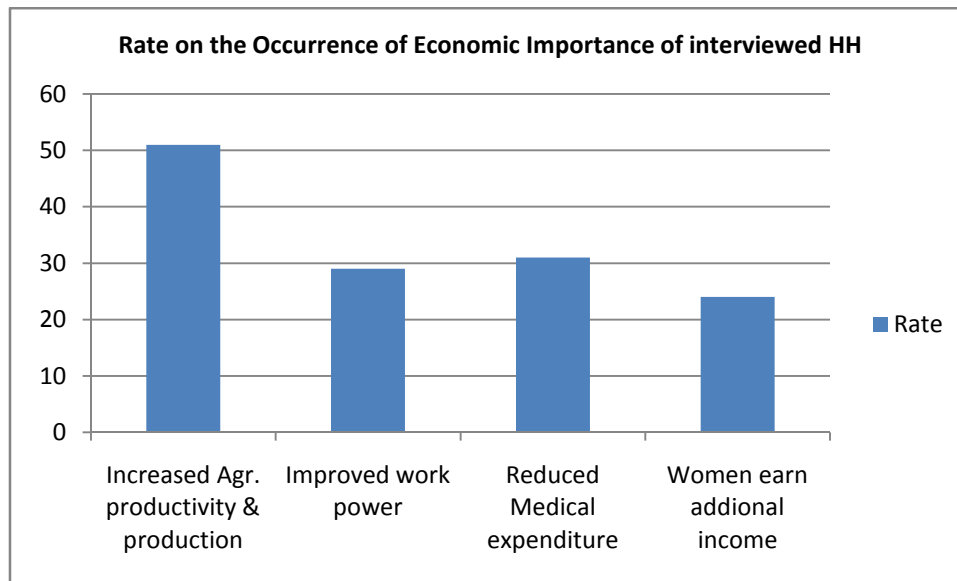


Figure 10: Interviewed HHs response on the economic benefits of the intervention

4.6.2. Social and Psychological Impacts

Among the several social impacts gained as a result of the project interventions, the most commonly mentioned were; getting time for social commitments as a result of reduced distance of water sources, sufficient time for children especially girls for their school, psychological benefit because of having latrine that keeps privacy and improved personal hygiene.

In the women focus group discussion in Komeshiga 27 kebele, a women said “In earlier times we were defecating either in open spaces or in a pit that is not sheltered and hence we were forced to defecate only after the sun set sheltering the darkness. When some time there exists force full things like health problem that push us to defecate or pee during day time we were ashamed of people passing nearby while defecating. But now thank to the awareness created, we are proud for having a clean and sheltered latrine that keeps our privacy and we can use any time we need.” This idea of the women was supported also by

other informants. They mentioned that not only the availability of latrine but also the water provision and sanitation services have produced a lot of social benefits to the rural community under the study area. The information obtained from the HH interview revealed that more than 60% of the interviewed HH members mentioned that they are proud for using latrines.

An Elderly from same kebele, Komeshiga 27 Kebele mentioned that because of the access of water they get sufficient time for social commitments. He said “we have time to go to church, mosques, visit relatives, go to market, especially women because the water is near villages, which this was difficult before the intervention”. From the house hold interviewees almost 33% of them mentioned that they have got this benefit as the result of the new intervention.

Young girls were one of the social groups responsible for water collection. As a result of the water access, the participation of girls in schools increased and those who already attending avoided being late coming or absent from classes. A teacher from Komeshiga25 kebele realized this saying that “our students especially girls were coming school late as they are responsible to fetch water early in the morning before class, but now a day water is near villages and girls come on time to school.” More than 13% of the interviewed HHs also mentioned girls’ school time is improved.

The other very important attribute of the intervention was that it enabled the community to keep their personal hygiene and happily accept their guests. Before the project they were suffering for not regularly taking bath and wash clothes, cooking utensils and also get ashamed when guests were visiting them due to lack of water and latrine. Now days these all are changed; people can wash clothes, take a bath, not ashamed when guests are coming; water is available to wash hands or body and latrine is available for the guest

privacy. This importance of the project has been mentioned by about 55% of the interviewed HHs.

From the men focus group discussion at Ateto kebele, one of the participants mentioned that “we were not having a clean space to sit for talking or kids to play, all the spaces were full of dirt, full of flies, and bad smell due to outside defecation. However currently open fields are clean; children can play, elders and neighborhoods can talk under a tree shade, open spaces are clean around home for ceremonies like weeding, deaths or others.”

The rate of occurrence of the interviewed HHs on the social attributes of the project intervention is presented on Figure 11 below.

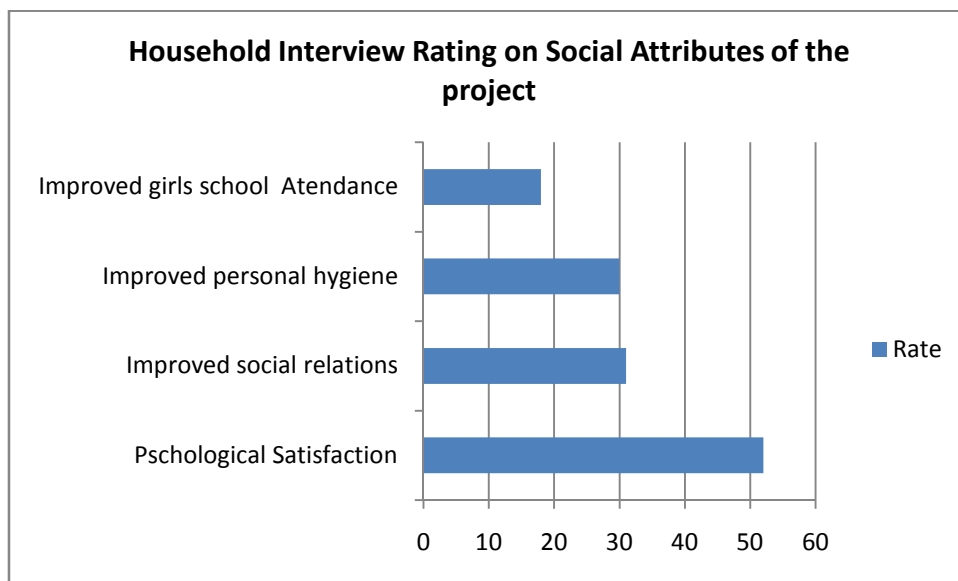


Figure 11: Interviewed HHs response on the social benefits of the intervention

4.6.3. Environmental Impact

The Environmental impact is very significant in water supply system development and sanitation service provision to the rural community. An improved water supply system is one of the ways to maintain the sustainability of the water supply throughout the year. The water table can be maintained stable at every point of time in the year. Access to

potable water from the improved sources will facilitate to clean the water points in order to avoid mud, animal dung, and insect breeding. The water supply interventions above all help to reduce the occurrence of water born diseases.

The above idea was supported by most of the key informants. For instance a health extension worker at Komeshiga 25 said “the location for the water source is the same but before the intervention the water points get dry every two or three months and people were forced to excavate for another in order to get water but after the shallow well constructed, we don’t see the water amount is reducing throughout the year. People are fetching every day but the water stays stable without reducing.” The majority of the interviewed HH members also supported this idea that the water supply from the new improved water structure serves throughout the year.

As a result of the project intervention, water sources contamination minimized. No open defecation and waste disposal and these two have reduced the flow of dirt materials to rivers, streams, ponds and unprotected springs and hand dug well by flood. Animal and human beings were using from the same sources before. Therefore, in previous times the water sources were highly contaminated and the water collected from these sources led the community for different water born diseases. However after the intervention of the project in the area, since all the structures are protected, absence of outside defecation, separated water for animal and human beings, water pollution is minimized and as a result the health situation of the people improved. In supporting this Idea, an elderly man from Ateto Kebele said “Our rivers and streams are clean, we have clean fields, and our water sources are not contaminated by our excreta”.

Sanitation service is the other important factor for environmental impacts. In the study area almost all households have their own private pit latrines. Among them, 84% have

improved and hygienic latrines. Most of the HHs also excavated pits for waste disposal. All the kebeles under this study graduated for ODF and there is no open defecation. Open defecation is considered as a taboo in these kebeles and if someone found defecating open he will be penalized based on the rules developed by the community. In addition to the awareness created by the project staff not to defecate in open places in particular and about sanitation in general to the communities, children also aware to shout on a person defecating or peeing outside of latrine.

As a result of the sanitation promotion activities, dwelling compounds, open fields, farm lands are clean and free of human excreta and dirt. The breeding of house flies, mosquitoes have reduces a lot. Bad smells in dwelling areas are now only history in the three kebeles. The occurrence of disease such as diarrhea, malaria, skin diseases and worms reduced significantly. From the rate given to the environmental impacts, 75% of the interviewed households witnessed that the environment is clean and insect breeding is reduced. The detail of the rate given by the interviewed households is shown on Figure 12 below.

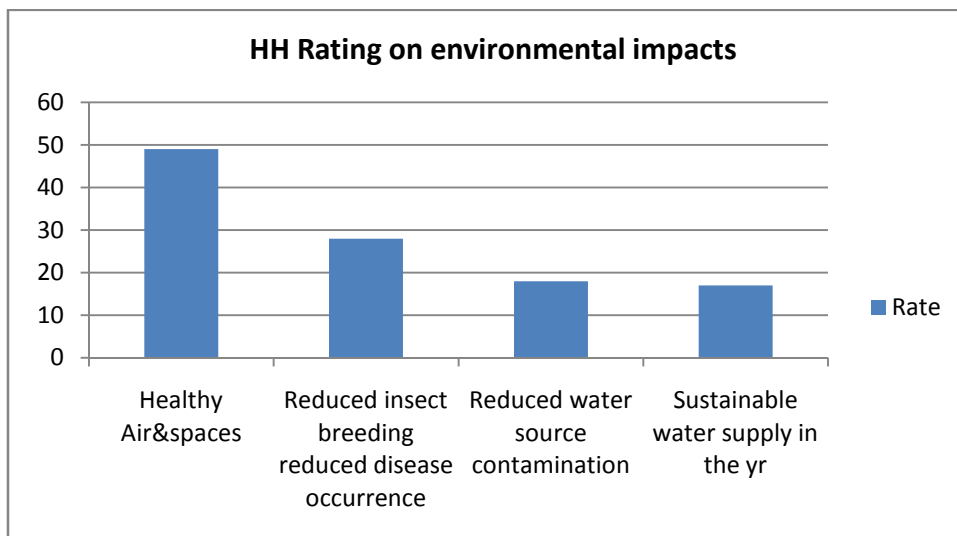


Figure 12: Interviewed HHs response on the Environmental Impacts of the intervention

4.7. Appropriateness of the Water Structures and Sanitation Services

Hand pump technology is not a new technology for the target communities. They have the experience of using hand pumps even though the majority of the previously constructed water structures were not currently functional because of serious problems. The main water sources available in the study area is ground water. Because of these reasons and its relatively easy management, provision of good quality and quantity of water and better cost, shallow well with hand pump is preferable and appropriate for the target community. CLTSH is also currently believed the best approach for rural sanitation and hygiene promotion as it fully involves the participation of the community.

4.8. Achievements of Project

The project was designed to fully fill targets under water supply, sanitation and hygiene promotion and capacity building of the woreda offices and communities. To achieve these targets several activities were planned by the project. The achievements of the project under each component are briefly discussed below.

4.8.1. Water Supply System

The main objective of the water supply system was to increase access to improved water sources for targeted beneficiaries. The indicator set for this was, 75% of project households collect water from an improved water source. All the planned activities (schemes) under this component have been accomplished by the project. The detail activities planned and accomplished specifically to the target kebeles of this study is described on Table 11 below.

Table 11: Water Schemes Plan vs Achievement in the Target Kebeles

| Kebeles | Types of scheme planned | Planned | Achieved | No of Beneficiary |
|-----------------|--|----------------|-----------------|--------------------------|
| Komoshiga 27 | Shallow Borehole with hand pump | 2 | 2 | 770 |
| | Rain water harvesting Tank for School, 10000Litres Capacity | 1 | 1 | 188 |
| | Rain water harvesting Tank for Health post, 10000Litres Capacity | 1 | 1 | 15 |
| Komoshiga 25 | Rehabilitation of hand pump | 1 | 1 | 310 |
| | Shallow Borehole with hand pump | 2 | 2 | 1240 |
| | Rain water harvesting Tank for School, 10000Litres Capacity | 1 | 1 | 383 |
| Ateto | Shallow Borehole with hand pump | 3 | 3 | 800 |

Based on this result, the final project report revealed that 87% of the project HHs collects water from improved water sources. From this figure, the achievement is more than what was targeted by the project (which was 75%). This figure also shows that the water coverage from improved water sources is significantly increased from the beginning of the project which was only 20%.

4.8.2. Sanitation and Hygiene Promotion

The objective in this component was to improve safe hygiene practice among targeted beneficiaries and the indicator set was 85% of targeted communities are declared free of open defecation. This objective is mainly revolving about awareness creation and attitudinal changes except for school VIP Latrine construction for two schools in the project target areas. The communities are mobilized on sanitation and hygiene practices using Community lead Total Sanitation and Hygiene (CLTSH) approach in order community construct latrines and keep their areas clean. The sanitation related constructions accomplished by the project are presented on Table 12.

Table 12: Sanitation Schemes Plan vs Achievement in the Target Kebeles

| Kebeles | Types of scheme planned | Planned | Achieved | Beneficiary. |
|-----------------|---|----------------|-----------------|---------------------|
| Komoshiga 27 | VIP Latrine (with 8 stances Plus hand washing facility) | 2 | 2 | 188 |
| Komoshiga 25 | VIP Latrine (with 8 stances Plus hand washing facility) | 2 | 2 | 383 |

Based on the final report and information obtained from project staff and WWO experts, it is possible to understand that 94% of the targeted kebele HH have their own private latrines. From this figure 84% reached to have improved and hygienic latrines. All the three kebeles are declared that they are free of open defecation. Converge of hygienic latrines also increased from 32% at the beginning of the project to 84%.

Some of the major activities achieved under sanitation and hygiene promotion include; training on CLTSH for woreda resource persons, kebele ignition team (KIT), volunteer community health promoters (VCHP), conduct CLTSH campaign, supportive supervision and monitoring, school WASH training for primary school teachers, school hygiene and sanitation promotion activities and conduct review meeting with stakeholders. These activities have been helped a lot to achieve the targets set for hygiene and sanitation.

4.8.3. Capacity Building

The main objective under this was; woreda water and health offices and community institutions have improved capacity to sustain WASH services in the rural target communities. To attempt this objective, the project provides water office capacity building activities which focus basically on training and equipping, establishing and supporting water management committees and conduct joint monitoring and evaluation with the local government bodies and communities. This capacity building activities were believed significantly important for the sustainability of the project achievements.

CHAPTER FIVE: KEY FINDINGS, CONCLUSION AND RECOMMENDATION

5.1. Key Findings of the Study

The majority of the communities under the study were using unsafe drinking water from the natural sources and most of them did not have hygienic latrines. The information obtained from the different sources of this study revealed the same. However, significant amounts of improvements and impacts observed after the intervention of the project in the target communities.

The access and coverage of water in these communities were very poor. The main sources of drinking water were rivers and streams, unprotected springs, open hand dug wells and only few proportion of the targeted people fetch water from hand dug wells with hand pumps. This has been added work load on the community especially on women and girls as they are the main responsible persons to fetch water for the household consumption. The work load prohibited women to be involved in other economic activities and not able to get time for their social commitments. Girls could not attend schools or come late as they are responsible to fetch water from far distances. It is not only the far distance that challenges girls and women but also the long queue to wait until their turn reaches to fetch a single pot of water. Before the project intervention it takes the majority of the households half to an hour to fetch water. The project intervention has constructed shallow wells with hand pumps. The majority of the target communities have access to potable water from these sources within a distance of less than 10 minutes walk. The water coverage also increased to 87% compared to 20% at the beginning of the project.

The quality of water the community using were very poor; animal and human beings were using from the same sources. As most of the water sources were not protected and fenced

they were exposed for contamination. Except some of the HHs most of them do not have any experience of treating water at home and hence were affected by several water born diseases. The water from newly established water supply systems is tested by a laboratory before it get used for consumption, treated with chemicals and is free of microorganisms.

The daily HH water consumption has been increasing as a result of the new water structures. It has been increased from an average daily consumption of 7 liters per person to 10.2 liters per day per person. However this amount is still far below the standard (15_20 liters per day per person). This shows that the water consumption of the community is still very low. From the focus group discussions it was possible to understand that the WMC has fixed time for water fetching and decided the amount of water a HH to fetch in a day. This has prevented the HHs to fetch more water for use. Some of the poor families also lack big contains to fetch and store water even for the permitted amount. Members of the committee said the reason for the amount to be fixed was to save the water. They have a fear that the water may dry before the rainy season though water experts disclosed that the potential of the BHs is sufficient throughout the year.

The functionality of the newly constructed structures counts more value than the availability of the structures in the community. Even though the project rehabilitated the previously constructed water points (by other organizations) that were non functional, two of the new structures were also having problems especially with the handle of the hand pumps. Focus group discussants, including some member from WMC mentioned that the problem was reported to the woreda water office requesting support but no response was obtained. This raises the question of sustainability on the outcomes of the project.

The new water structures are managed by water WMC and trained water technicians selected from the users of the water structures. The committee is composed of men and women members. They are responsible for collection of monthly contribution from the users, maintenance of the water structure, keeping the water structures protected from damages; work activities like fencing, responsible for the sanitation of the water structures, responsible for chemical purchase and add to the structures in time intervals and they are responsible to prepare a schedule for water fetching and assigning an attendant from members in round bases during water is fetched by members from these water structures. The WMC members and water technicians obtained trainings on the subject. As the water is managed by WMC that are selected from the community and each member has part in the monthly contribution, serve as attendants in rotation, contribute labour and materials for the constructions, the participation of the community look good. However as the participation level of the community is low in some communities especially in monetary terms. The researcher observed from the focus group discussions that the community is still expecting more support from the government and the project. For little maintenance required for the hand pumps of shallow wells, the committee members were expecting much support from the woreda water office to be maintained.

Sanitation and hygiene were at very low status in the targeted communities. Only few members of the community (32%) were using hygienic latrines. Most of the community members were defecating in unhygienic or unsheltered latrines or in open spaces. Waste matters were discarded in open spaces around residences and in compounds of houses. In addition to the bad smells and discomforts, it has brought to them several diseases like diarrhea, typhoid, malaria, worms and skin diseases. The community especially children under five and lactating mothers were suffering more from these diseases. With the

project intervention coupled with the government health extension services, currently about 84% of the project target community have a hygienic pit latrines. All interviewed HHs have their own separate covered and sheltered latrine in their compounds. Communal latrines are also constructed at the road sides for passengers. Nobody in the community defecate outside of the latrine. If someone found doing it he will be penalized according to the rule set by the villagers. The entire project target kebeles graduated and installed a billboard that shows that particular kebele is free of outside defecation (ODF).

The achievement on sanitation and hygiene was due to the approach of awareness creation made by the project. The approach was CLTSH which involves the community intensive participation. The HH survey results, key informants and focus group discussants showed that the awareness of the community including children with regards to sanitation is very high. In addition to the latrine construction and usage, the community was aware as how to discard their HH wastes and how to keep the personal hygiene of their HH members. They also get educated how to keep clean their HH utensils. As a result, the health situations of the community get improved and psychologically happy HHs established.

The project has brought several importance and impacts on the lives' of the target community. These impacts can be categorized as economic, social and environmental impacts.

Findings of the study showed that the impact of the project was significant in providing potable water with accessible distance, better quality and quantity to the rural community. The awareness created on the sanitation and hygiene also contributed a lot in reducing the occurrence of diseases in the area.

The project has produced tangible impacts on the lives of the community in terms of economic situations. Some of the economic impacts include; water is accessible and is pure, the time saved and the health improvements of the people helped the rural work power to be improved. This in return helped to increase productivity and production of agriculture. The project helped to reduce work load on women and girls as they are the main responsible people for water collection and sanitation in the community and hence women get time for other economic activities. Improvement in the health of the community reduced their medical expenses. It has also contributions in the food security status of the community.

The other impact is social attributes of the project; the community members especially women and girls can get spare time for their social commitments and other responsibilities as water is accessible in near distances. Women can visit relatives, go to religion places, etc. It enables girls to attend their education. Defecating in the sheltered and clean latrines has benefited the community as it keeps privacy instead of outside defecation which was frustrating when people were passing around during an individual is in open defecation.

The other impact observed was environmental impact. The project helped to reduce water sources contamination, enable to maintain ground water serving the community sustainably throughout the year. It enabled villages to have clean spaces where children can play and elderly can talk safe. Moreover the breeding of insects like house flies, mosquitoes have reduced and as a result the occurrences of communicable disease with these insects reduced in the community.

The new water structures also contributed a lot in avoiding conflicts among the neighboring communities on the ownership of the water sources and in reducing fighting that have been created because of long queue of water fetching.

5.2. Conclusion

The main objective of this study paper is to assess the impacts of rural water supply and sanitation services with special emphasis to water supply and sanitation project of none governmental organization's (IRC) intervention in the project target communities. To this effect a HH survey, key informant interview, focus group discussions, questionnaires and personal observation were applied to collect the relevant data from the targeted communities. From the findings of the study, the following concluding remarks are pointed out in accordance to the specific objectives of the study.

All the project targets and objectives in the target communities were accomplished according to the initial plan of the project. All the planned water structures and all sanitation activities have been completed. The first objective of the project was to increase drinking water access to 75% of the community. This objective reached to 87% which is more than the planned target. As the same time sanitation activities plan was to reach 85% of the target community villages to declare ODF. The accomplishment was more than the expected, which is all the three targeted kebeles declared ODF. Other capacity building activities which include mobilization, trainings and provision of materials for the government staff and the community members have also been accomplished according to the plan.

The access and coverage of potable water and sanitation in the study kebeles have been improved a lot. Results obtained from the HH survey revealed that the vast majority of the interviewed households fetch water from the improved water structures, with in a

distance of less than 10 minutes of walk. There is no long queue as previous and it saves their time. Information obtained from the final report of the project indicates that the coverage of potable water reached to 87% in the target community.

Sanitation coverage in the target community also increased a lot. At the beginning of the project only 32% of the HHs had improved latrines but after the project intervention this figure reached to 84%. Not only coverage is increased but also the awareness of the community is improved on sanitation and hygiene. No member in the community defecates outside of latrine and people are practicing hand washing on critical times that demands hand washing.

From the HH survey it is possible to understand that the project intervention have contributed on the changes of the lives' of the community. Both water supply and sanitation interventions added value to their living conditions. The importance of the project can be seen from its impacts on the people. The intervention has created economic, social and environmental benefits to the target communities. The improvement on the access to water supply helped the community to save time and can use the saved time for other productive purposes and as a result their income increased. The increase in production and income has played part in the community's food security status. The access to water and sanitation also reduced diseases in the community and this reduced their medical expenditures. The social benefits identified include; improved health, improved girls school participation, reduce work load on women, and reduced conflicts raised due to long queue during water fetching. People were also very proud for not defecating in open due to the fact that they are using sheltered latrines which benefit them psychologically as they are kept their privacy. The other very important impact observed was environmental. Villages are clean, children can play free in open spaces, no bad smell in villages, breeding of insects like mosquitoes and house flies reduced, water

sources contamination reduced and finally the occurrence of diseases reduced in the target communities.

The technology and the approach used to introduce the water system and sanitation service is found imperative. As the main water resource in the area is ground water and the technology for the development of shallow well is relatively better in price and in management terms. It would be advisable even to scale up the same for other neighboring communities which are in shortage of drinking water. The sanitation activities using the LTSTH approach extremely changed the attitude of the community and it has to be a continuous process to keeping it sustainable.

In general terms the project achieved its initial targeted objectives and brought a significant impact on the living condition of the target people. However with these achievements and success of the project some limitations and lessons are identified. Based on the findings, the following recommendations are forwarded that can help to provide enhanced interventions that better produce impact on the community's live.

5.3. Recommendations

1. Even though the constructed shallow wells can give or produce sufficient amount of water for the target communities to fetch up to the minimum standard of water required per person per day, the amount of water fetched and utilized by the HHs is still much lower than the standard. This was mainly because of the WMC has fixed the amount of water to be fetched by a single HH in a day. Their assumption was to save the water to use it in dry seasons. This type of thought has to be changed as the water supply can serve the whole year without any shortage. In this regard the woreda water office and the kebele administration should involve themselves to aware the WMC and the community to enable them to use more water in a day.

2. Impact of a project is highly attached to the sustainability of the project. Unless the project is sustainable the benefits obtained could not remain long lasting. Some of the new water structures are stopping functioning due to lack of small maintenances. The causes for not functioning are simple but because of lack maintenance of the structures the community could not get the required services. For instance because of the problem with the handle of the new shallow wells at Komeshiga 25 and Komoshia 27 kebeles, community could not get sufficient water from the structures. It takes them more time to fetch water as the handle is strong to pull water from the well. For better maintenance, the water technicians at the kebele level should get better training and get access to spare parts to maintain such small problems. The WWO should be responsible and need to provide better trainings for the water technicians and facilitate the access of spare parts. The WWO is also expected to give attention and respond to the enquiries of the WMC based on the level of maintenances; if big damage is occurred with the water structure, it demands the support of the WWO water technicians to maintain the damaged structure.
3. The other very crucial thing for the sustainability of the benefits obtained from the project depends on the participation of the community. Even though communities were participated in the project implementation process, the level of participation especially in some villages found very low. Most of them mobilized only stones for the construction of the water structures. Communities also participated in the sanitation and hygiene promotion activities. However from the focus group discussion and from the HH interview it was possible to understand that there is a sort of expectations from others. The communities should be capacitated to develop sense of ownership and find solutions by themselves for those problems which can be managed at community level. The researcher observed the community was expecting

that the water structures with problem to be maintained by the government or the project. To enable the community fully participate and develop sense of ownership a continuous awareness creation should be given to the community especially by the wereda water and health offices. Moreover the level of participation should be improved in every step of the project starting from the project idea, planning, implementation and monitoring and evaluation.

4. The sanitation and hygiene promotion activities look good and most of the communities are happy with it. However unless the process is a continuous one, it may be reversed back some time in the future. There should be continues follow up and support from the kebele health extension workers. There should be improvements with materials of construction of latrines in the forthcoming as most of the HHs constructed their latrine with simple materials that may not be durable for long. The fear is when the construction get demolished the community may not construct another latrine and may go back to its previous status. Therefore, the community should be advised in continuous manner to upgrade its latrines by the health extension workers.
5. Most of the interviewed HHs said that they burn the dry waste collected from house either in the pits or in open spaces. This is one way to reduce dirt from house and the residence area. However as the majority of the household have farm lands, it is advisable to aware them to use it as a compost to increase the fertility of their land. This will have a contribution in increasing productivity and production of crops and finally help to contribute for the food security of the community. This also can help the farmers reduce their expense for buying modern fertilizers which are not advisable in environmentally safe farming. In this regard the kebele DAs has to work jointly with the HEWs in order to mobilize and aware the community.

6. As the main water resource in the area is ground water and the price and management of the technology of shallow well is relatively good, and the LTSTH approach very important to change the awareness of the community with their full participation for improved sanitation, it is advisable to scale up and replicate the project experience to other neighboring communities that are facing the same problem. Therefore, it is recommended that government and NGOs involved in rural water supply and sanitation projects to replicate the project experience for the other communities.

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APPENDICES

Appendix 1: Household Interview Questioners

I. Background Information

1. Name of interviewer _____ Questionnaire No _____
2. Date _____
3. Kebele _____
4. Village/Got _____

II. Household Member Information

1. Name of interviewee/respondent _____
2. Sex of respondent, (A) Female (B) Male
3. Age of respondent (years) _____
4. Relationship with the head of HH (A) Wife (B) Husband (C) Child (D) Relative
5. Marital status (A) Married (B) Divorced (C) Single (D) Widow
6. Household Size _____ (A) Male _____ (B) Female _____
7. Education level (A) No formal education (B) Read and write (C) Primary (Grade 1-8) (D) Secondary (E) Other (specify) _____
8. Main economic activity of the family (A) Crop farming (B) Livestock rearing (C) Traditional Gold Mining (D) Bee hive (E) crop and livestock (F) Petty trading (G) Other (Specify) _____
9. Monthly estimated Average income (BR) _____

III. Water Supply

10. What was the main sources of drinking water of your house hold before the IRC intervention
(A). Piped water
(B). Borehole/shallow well fitted with hand pump
(C). Protected Spring
(D). Unprotected spring
(E). Ponds/dams
(F). Rivers/streams
(G). Protected Hand dug well
(H). Unprotected hand dug well
(I). Other (Specify) _____
11. What is the main sources of drinking water for your family after IRC intervention/considering also water supply scheme under construction/
(A). Piped water
(B). Borehole/shallow well fitted with hand pump/
(C). Protected Spring
(D). Unprotected spring
(E). Ponds/dams
(F). Rivers/streams
(G). Protected Hand dug well

- (H). Unprotected hand dug well
 (I). Other (Specify) _____
12. Does the water from these sources serves throughout the year before the intervention?
 (A) Yes (B). No
13. If your answer for Q12 is no how long does water is available from these sources in the year?
 (A) For less than three months (B).for 3-6 months (C). for more than six months
14. How long does it take you to go and back to collect water before the intervention of IRC?
 (B) Less than 10 minute
 (C) 10-15 minutes
 (D) 15-30 minutes
 (E) 30 minutes-1hour
 (F) More than an Hour _____
15. How long it takes you after the new project structures constructed?
 (A) Less 10 minutes (B).10-15 minutes (C) 15-30 minutes (D) other/specify _____
16. Are your new water points functional? (A) Yes (B) No
17. If your answer is no for Q16 what is the reason behind?
 (A) The structure not yet complete
 (B) The structure is broken
 (C) Poor water quality
 (D) The structure is very far from villages
 (E) The community prefers other natural souses like rivers, ponds
 (G) Other (identify) _____
18. Who usually fetch water from the HH?
 (A) Wife/Mother
 (B) Young girls
 (C) Young boys
 (D) Husband/Father
 (E) Other/specify _____
19. Are children ages of less than 15 years usually fetching water? (A) Yes (B) No
20. If your answer is yes for Q19 which sex most dominantly fetch water?
 (A) Girls (B) Boys
21. What amount of water you use for the HH members in a day before the intervention?
 (A) 5-10 liters
 (B) 10-20 liters
 (C) 20-40 liters
 (D) More than 40 liters (specify) _____
22. What amount of water you use for the HH in a day after the intervention? __liters.
23. How was the quality of water before the intervention?
 (A) Good (B). Poor (C) not understand
24. Is the quality improved after the intervention? (A) Yes (B) No
25. If your answer is yes for Question 23 how you express the quality?
 (A) Best (B). Good (C). Poor
26. Does the water you get from the new interventions treated with chemicals?
 (A) Yes (B) No
27. Do you treat water at home before the intervention? (A) Yes (B) NO
28. If yes how you were treating? (A). Boiling (B). Filtering (C). Staining with cloth

- (D). Add water agar (E). Other (specify) _____
29. Who manages the newly constructed water points?
 (A) Water committee (B) Members in round (C) beneficiaries in shifting way
 (D) Other/specify _____
30. What is your satisfaction level with the new/improved water system? A) High B) Medium C) Low
31. Do you pay for water? (A) Yes (B) No
32. If your answer is yes for Q31 how much you pay per month? ETB _____
33. For what purpose the payment used? (A) Maintenance (B) Buying chemicals
 (C) Guard payment (D) Other/specify _____

IV. Sanitation Facilities

34. Does your HH have latrine before the intervention? (A) Yes (B) No
35. If your answer is yes for Q32, what type of latrine was it? (A). Pit latrine (B). Other (specify) _____
36. If your answer is no for Q32 where was family members defecate? (A) Open space in the compound (B). Bushes out of the compound (C) Open farm lands
 (D) Other (specify) _____
37. Do you have a latrine now? (A) Yes (B) No
38. If your answer is yes for Q37 what type of latrine you have? (A) Private pit latrine uncovered (B). Private pit latrine covered (C). Communal pit latrine (D). VIP latrine (E). other (specify) _____
39. If your answer for Q34 is no, what is the reason behind that you were not constructing latrine? (A). Lack of money (B). Lack of awareness (C). Lack of space (D) Inaccessibility of local construction materials (E) Others (specify) _____
40. How you get the awareness to construct a latrine now? (A) From the new intervention community conversation (project staff) (B). From HEW (C). From mass media (D) Other (specify) _____
41. In how long you clean your latrine? (A). every time after use (B). Every day (C). Every other day (D). Once in a week (E). Other (specify) _____
42. Do your family members wash hands after use of toilet? (A) Yes (B) No (C) Some times
43. If yes what is the usual place and type of water for hand washing? (A). Jug at station (B). Small jury can at station (C). Tippy tap at station (D). Other (specify) _____
44. What type of detergents your family use for hand washing? (A). Soap (B). Soil (C) Ash (D). No detergent used (E). Other (specify) _____
45. Does your family members aware of washing hands? (A) Yes (B) No
46. If your answer is yes for Q43, please indicate during which of the following events? (A). before feeding children (B). Before cooking (C). After latrine (D) before eating (E). After cleaning a child (F). Other (Mention) _____
47. Does your family members have place to remove dry wastes? (A) Yes (B) No
48. If yes for Q45 how you remove dry wastes? (A). Discarding in a pit (B). Burning it (C) Discarding in open space (D). Other (specify) _____

V. Impacts Produced as a Result of Water Supply and Sanitation Services(New Interventions)

49. What was the main water born diseases that affect members of your HH before the intervention? (A). Diarrhea (B). Typhus/typhoid (C). Skin diseases (D). Other (specify)_____
50. Have the occurrence of these diseases reduced after the intervention? (A) Yes (B) No
51. If yes how you value the importance? (A). Reduce time of taking care of sick people/production increase (B). Reduce medical expenditure (C). Increased family happiness (D). Other (specify)_____
52. What economic benefit you have received as a result of access to potable water due to the intervention?
(A) Time saving for other productive activities
(B) Improved health situation improved working power for more production
(C) Reduced medical expenses
(D) Young Girls and boys can have time to attend school
(E) Women have time for economic activities
(F) Others (specify)_____
53. What economic benefits you attained as a result of having sanitary services for your HH?
(A) Improved health situation reduced medical expenditure
(B) Reduced time to take care of sick person in the household
(C) Health improvement Increased production and productivity
(D) Others (specify)_____
54. What social benefits you gained as the result of water and sanitation intervention
(A) Psychological benefit due to not defecating in open space
(B) Having time for social commitments
(C) Guests can use the facilities
(D) Personal hygiene
(E) Children get time for their education
(F) Other benefits (specify)_____
55. What environmental impacts gained as the result of the intervention?
(A) Clean spaces/grounds for children to play due to no outside defecation
(B) Reduced flies and mosquitoes breeding and reduced disease occurrence
(C) Reduced rivers, springs and ponds contamination
(D) Sustained and regular water supply availability throughout the year
(E) Other (specify)_____

VI. General questions

56. Does your HH participate in the water structures construction? (A)Yes (B) No
57. If your answer is yes in what way you participated?
(A) Cash contribution
(B) Material contribution
(C) Labor contribution
(D) No contribution
(E) Other (specify) _____
58. Do you have any role in the management of the water points? (A)Yes (B) No

59. If yes in what way?
 (A) Monthly contribution
 (B) Payment for water service
 (C) Keeping the water points in round
 (D) Keeping records of water fetching in round
 (E) Fencing the water points
 (F) Others (specify)_____
60. Do you think the new intervention improved the water access to your family?
 (A) Yes (B) No
61. Do the new interventions in general improve your live? (A) Yes (B) No
62. If yes describe the major improvements your family gained.

63. If you have any additional information please mention some.

Appendix 2: Guiding Questions for Focus Group Discussion (FDG)

1. What were the sources of drinking water before the intervention?
2. Is the water from these source quality, accessible, serves throughout the year?
3. What new structures constructed in your kebele by the project intervention? Are all functional now?
4. Do you think the project intervention improved the water access and sanitation services for the community?
5. What are the major economic, social and environmental impacts attributed to the community by the intervention?
6. What was the participation of the community in the project implementation?
7. How the water structures managed? Who is responsible to manage? How do you elect committees? What is the role of committees? Are the committees trained? Are committees efficient?
8. How the communities use/keep sustainably the constructed water and sanitation structure?
9. How is the improvement of the knowledge and awareness of the community to apply the new intervention?
10. If you have any additional information

Appendix 3: Interview Questions for Kebele HEWs

1. Name of the respondent _____ age _____, sex _____, education _____
2. Year of service, in other place and current kebele _____
3. What were the basic water and sanitation problems in this community?

4. What were the main sources of drinking water in this community before IRC project intervention? _____

5. How long/average it takes HH to collect water? _____
6. Were human beings and animals having different sources of drinking water?

7. How long the water lasts in the year from these sources?

8. Who in the HH is mainly collect water? _____
9. What new water structures/sources developed by the project?

10. What was the participation of the community in the development of the new intervention? _____
11. How is the new water structures managed? Who manage it?

12. Were the communities use toilets and has waste discarding places? How much of them?

13. Those who don't have toilets where they defecate their excreta?

14. Are the diseases in this area related to unsafe drinking water and poor sanitation? And what are these main diseases?

15. Who is the most affected by these diseases in the community?

16. What is the role of your/ organization in the improvement of water and sanitation in the kebele?

17. Are the new interventions improved the water coverage and access to the community? How? _____
18. Do you believe the communities aware of the importance of sanitation practices ? Or do they use latrines properly? _____
19. Does the new intervention help you/organization to achieve your objectives in this regard? How? _____
20. Are the new interventions improves the lives of the community? What are the economic, social, environmental and other benefits and impacts)?

Appendix 4: Interview Questions for Schools Teachers

1. Name of the respondent _____ age _____, sex _____, education _____
2. Year of service, in other place and current kebele _____
3. What are the basic water and sanitation problems in this community?

4. What were the main sources of drinking water in this community before IRC project intervention? _____

5. How long/average it takes HH to collect water? _____
6. Were human beings and animals having different sources of drinking water?

7. How long the water serves in the year from these sources? _____
8. Who in the HH is mainly collect water? _____
9. Does water fetching have a negative impact on children specially girl to go to school?

10. Does your school use toilets and have waste discarding places? How was the quality of the toilet? How about the communities? _____

11. What new water and sanitation structures developed by IRC project for the community and school? _____

12. What was the participation of the community/school in the development of the new structures? _____

13. How is the new structures managed? Who manage it?

14. Those communities who don't have toilets where they defecate their excreta?

15. Are your students dropout because of water and sanitation born diseases? Describe.

16. What is the role of your/ organization in the improvement of water and sanitation in the kebele/school ? _____

17. Are the new interventions improved the sanitation and water coverage and access to the community or your school? How?

18. Do you believe the communities aware of the importance of sanitation practices? Or do they use latrines properly? _____

19. Are the new interventions improves the lives of the community? What are the economic, social, environmental and other benefits and impacts)?

Appendix 5: Interview Questions for Kebele Development Agent

1. Name of the respondent_____ age_____, sex_____, education_____

2. Year of service, in other place and current kebele _____

3. What were the basic water and sanitation problems in this community?

4. What were the main sources of drinking water in this community before IRC project intervention? _____

5. How long/average it takes HH to collect water? _____

6. Were human beings and animals having different sources of drinking water?

7. How long the water lasts/serves in the year from these sources? _____

8. Who in the HH is mainly collect water? _____

9. Dose this water problem has a negative impact on the productivity of the community? How? On which social group? _____

10. What new water and sanitation structures developed by the project?

11. What other activities done by the project in addition to construction?

12. Do you think targeted objectives and activities of the project achieved? Describe the acheivements _____

13. What was the participation of the community in the development of the new intervention? _____

14. How is the new water structures managed? Who manage it?

15. Were the majority of the communities use toilets and has waste discarding places?

16. Those who don't have toilets where they defecate their excreta?

17. What is the role of your/ organization in the improvement of water and sanitation in the kebele ? _____

18. Are the new interventions improved the water coverage and access to the community? How? _____

19. Do you believe the communities aware of the importance of sanitation practices? Or do they use latrines properly? _____

20. Are the new interventions improves the lives of the community? What are the economic, social, environmental and other benefits and impacts)?

Appendix 6: Interview Questions for Kebele Administration

1. Name of the respondent _____ age _____, sex _____, education _____
2. Year of service, in this position _____
3. What were the basic water and sanitation problems in this community?

4. What were the main sources of drinking water in this community before IRC project intervention? _____

5. How long/average it takes HH to collect water? _____
6. Were human beings and animals having different sources of drinking water?

7. How long the water serves in the year from these sources? _____
8. Who in the h is mainly collect water? _____
9. Dose this water problem has a negative impact on the productivity of the community and health? How? _____

10. What new water and sanitation structures developed by the IRC project?

11. What other activities done by the project in addition to construction?

12. Do you think all the targeted objectives and activities of the project achieved? Describe the achievements _____

13. What was the participation of the community in the development of the new intervention? _____

14. How is the new water structures managed? Who manage it? How is the sustainability of the water systems maintained? _____

15. Were the majority of the communities use toilets and has waste discarding places? _____

16. Those who don't have toilets where they defecate their excreta? _____

17. What other activities done by the project? _____

18. Are the new interventions improved the water coverage and access to the community? How? _____

19. Do you believe the communities aware of the importance of sanitation practices important? Or do they use latrines properly? _____

20. Are the new interventions improves the lives of the community? What are the economic, social, environmental and other benefits and impacts)? _____

Appendix 7: Interview Questions for Elderly in the Kebele

1. Name of the respondent _____ age_____, sex_____, education_____
2. What were the basic water and sanitation problems in this community? Its history (is water problem worsen or improved through time)? _____

3. What were the main sources of drinking water in this community before IRC project intervention? _____

4. What is the average distance to get water from these sources and how long it takes to go and come back? _____
5. Were human beings and animals get water from separate location? Explain. _____

6. What was the participation of the community in the development of the new intervention? _____

7. Were the communities happy with new intervention? How?

8. How is the new water structures managed? Who manage them?

9. Who in the HH is mainly collect water? _____
10. Were the communities use toilets and has waste discarding places? How mach of them? _____
11. Those who don't have toilets where they defecate their excreta?

12. Are people in the community get sick due to lack of water and poor sanitation in this area? _____
13. Are the new interventions improved the water coverage and access to the community? How? _____
14. Are the new interventions improves the lives of the community? What are the economic, social, environmental and other benefits and impacts)?

Appendix 8: Questionnaires for Government Staff (Regional & Woreda Health and water offices)

The main objective of this questionnaire is to collect information about the impacts on the rural water supply system and sanitation services implemented by IRC. Your information will help me to identify the basic impacts produced as a result of the intervention and the problems that need to be addressed. Therefore please give the actual information as much as possible. Thanks for your cooperation!!

1. Name of the respondent _____ age____, sex_____, education_____
2. Year of service, in other place and current position _____
3. What were the basic water and sanitation problems in this community?

4. What were the main sources of drinking water in this community before IRC project intervention? and how was the quality? _____
5. If there were constructed water structures in the kebeles who developed these structures? _____

6. Was the structures functional? If not what was the reason behind?

7. How long/average it takes HH to collect water? Before IRC project _____
After the project _____
8. Were human beings and animals having different sources of drinking water?

9. How long the water serves in the year from these sources? _____
10. Who in the HH is mainly collect water? _____
11. Does this have impact on children education and labour force productivity of the community? _____
12. When was the IRC WASH project started? _____
13. What new water structures/sources developed by the project? Please identify the types and number of the newly established water structures.

14. For how many people these water structures can serve?

15. Does the quality of water tested? Who tested it? How is the quality of water from the new structures? _____
16. What was the participation of the community in the development of the new intervention? _____
17. How is the new water structures managed? Who manage it?

18. Were the communities use toilets and have waste disposing places before the project? How much of them? _____
19. Those who don't have toilets where they defecate their excreta?

20. Are the diseases in this area related to unsafe drinking water and poor sanitation? And what are these main diseases? _____
21. Who is the most affected by these diseases in the community?

22. What is the role of your/ organization in the improvement of water and sanitation in the kebele? _____
23. Are the new interventions improved the water coverage and access to the community? Please compare the begging of the project and the current water coverage?

24. Do you believe the communities aware of the importance of sanitation practices after the project intervention? Do they use latrines properly?

25. Does the new intervention help you/organization to achieve your objectives in this regard? _____

26. Are the new interventions improves the lives of the community? How (economic, social, psychologically, other benefits and impacts)? Please give details.

27. What challenges have you observed in the implementation of the project and what possible suggestions you have?

28. If you have any other relevant information regarding this project

Appendix 9: Questionnaires for IRC Project Staffs

The main objective of this questionnaire is to collect information about the impacts on the rural water supply system and sanitation services implemented by IRC. Your information will help me to identify the basic impacts produced as a result of the intervention and the problems that need to be addressed. Therefore please give the actual information as much as possible. Thanks for your cooperation!!

1. Name of the respondent _____ age _____, sex _____, education _____

2. Year of service, in other place and current position _____

3. What were the basic water and sanitation problems in this community?

4. What were the main sources of drinking water in this community before IRC project intervention? How was the quality? _____

5. What was the initial water coverage status when the project was starring in this Kebele? How much of the communities get safe drinking water?

-
-
6. If there are constructed water structures before the intervention in the kebeles who developed these structure? _____

 7. Were the structures functional? If not what was the reason behind? _____

 8. How long/average it takes HH to collect water? Before IRC project _____ ,
After the project _____
 9. Were human beings and animals having different sources of drinking water?

 10. How long the water serves in the year from these sources? _____
 11. Who in the HH is mainly collect water? _____
 12. Does this have impact on children seduction and labour force productivity of the community? _____

 13. When was the IRC WASH project started? _____
 14. What new water structures/sources developed by the project? Please identify the types and number of the newly established water structures.

 15. Does the water quality tested before use? Who test it? How the quality of water from the new structures? _____

 16. For how many people these water structures can serve?

 17. What was the average per capita water consumption before the intervention and what is the amount after intervention? _____

 18. What was the participation of the community in the development of the new intervention? _____

 19. How is the new water structures managed? Who manage it?

 20. Were the communities use toilets and have waste disposing places before the intervention? How much of them?

 21. Those who don't have toilets where they defecate their excreta?

 22. Are the diseases in this area related to unsafe drinking water and poor sanitation? And what are these main diseases? _____

 23. Who is the most affected by these diseases in the community?

24. Do you believe the project targets/main activities interns of water supply and sanitation achieved? Please mention the targets and compare with achievement.

25. Are the new interventions improved the water coverage and access to the community? Please compare the begging of the project and the current water coverage? _____

26. Do you believe the communities aware of the importance of sanitation practices after the project intervention? Do they use latrines properly?

27. Do you believe that the objectives and goals of the project achieved? Explain

28. Are the new interventions improves the lives of the community? How (economic, social, psychological, other benefits and impacts)? Please describe the gained benefit/impacts in detail.

29. What were the major challenges in implementing the project? What could not achieved.

30. What possible suggestion do you have for improved project implementation?

31. If you have any information relevant regarding this intervention
